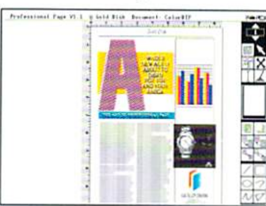

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Gold Disk has the answers.

For the Professional

Is there a serious desktop publishing program for the Amiga?

Definitely. The gold standard is Gold Disk's Professional Page. It's got features that have made it the choice of pros across the globe. Like built-in kerning, leading, and tracking.



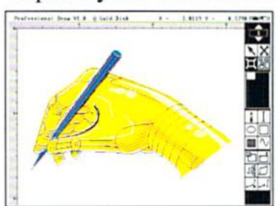
A wide variety of resizeable PostScript fonts. The ability to handle IFF bit-mapped graphics and structured graphics. Built-in text and graphics editing. Even the ability to output color separations for color publishing. Professional Page is US$395. 1 MB required.

How come my desktop publications just don't have that professional "slickness"?

Why not let a pro do some of the work for you? Gold Disk's Professional Page Templates package gives you over 50 classic layouts for ads, newsletters and brochures prepared by a top New York designer. All the type specs are built right into the pre-defined boxes, so you can just flow your copy right in. And the documentation is more than just a manual - it's a crash course in graphic design. The Templates package is US$59.95.

How can I create smooth, professional-looking graphics for my desktop published documents?

You need Gold Disk's Professional Draw, the first serious illustration program for the Amiga. It uses *structured* graphics, so curves don't have jagged edges when they're enlarged. Shrink or expand your illustrations, and they'll still look great. It has a user-



definable palette of millions of colors, supports PostScript, and works with the latest update of Professional Page. There's also an optional disk of pre-drawn structured clip art. Professional Draw is US$199.95. 1 MB required. Structured Clip Art is US$59.95.

Is there a quick and painless way to digitize drawings and photos for use in desktop published documents?

There is now. Gold Disk has developed a hardware/software interface for the Canon IX12 black and white scanner. It saves IFF pictures at 300, 200, 150, and 75 DPI. Simply feed a page into the scanner and about 15 seconds later, the job is done. It's that easy. Scanner and interface US$1095.

For the Home Studio

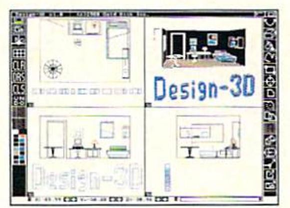
Is there a way to create high speed color Amiga animation that lasts longer than a few seconds?

You need Gold Disk's MovieSetter. It lets you create 32 color animation that's minutes, not seconds long. All without using truckloads of memory. There's a powerful on-screen tool kit, full panning control over stereo sound effects and music, and animation speeds as high as 60 frames per second. It comes with its own professionally drawn characters (called "MovieClip" files), or you can import art from your favorite paint program. MovieSetter is US$99.95. Only 512 K required. Extra MovieClip disks are US$34.95.



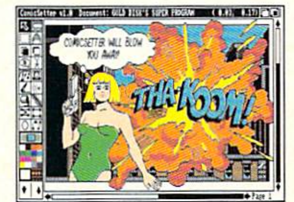
3D modeling and animation programs seem to require too much time, energy and patience. Is there a better way?

There sure is: Gold Disk's 3D modeling program, Design 3D. It's not only sophisticated enough to meet the demands of pros, but its elegant user interface makes it easy for the home hobbyist, too. You can model in wire frames with 6 line types and 16 colors. You can see 4 simultaneous views of your objects, with 4 programmable sources of light. And if you're an animator, there's the helpful option of importing/exporting objects to Aegis' VideoScape 3D. Design 3D is US$99.95. 1MB required.



I've got a hyperactive imagination, an undying passion for comic books, and an Amiga. Is there hope for me?

You clearly need ComicSetter, Gold Disk's one-of-a-kind program that lets you create multi-page color comics on a 1 MB Amiga. It's got tools for creating panels, word balloons, and color comic art. Or you can cut and paste "Comic Clip Art" characters and scenery drawn by pros. Even import artwork from your favorite paint program. You can print your work out on popular color or black and white printers. ComicSetter is US$99.95. Extra ComicArt packages are US$34.95.



For the Home Office

It seems like all Amiga word processors are either too slow and complicated or too simple to be useful. Isn't there a happy medium?

Yes. It's called Transcript, and it's brand new from Gold Disk. Not only is it easy to learn, but it has advanced editing features that even power users won't outgrow. Just as important, Transcript's been heavily "torture tested", so you can trust it to be durably "crash resistant". It has a built-in 90,000 word spelling checker and fully supports Professional Page. It's lightning fast. You won't want to use anything else. Transcript is US$69.95. Runs on 512 K.



I need a sophisticated budgeting program, but I can't budget much time to learn it. What's powerful but simple?

Gold Disk's Desktop Budget is the perfect program for you. The key is Amiga graphics: all of the elements of your budget are represented by their own icons. So balancing a complex budget is as easy as pointing and clicking your mouse. Features include automatic report generation, monthly payment reconciliation, year-end roll-over, and detailed records of all transactions. Desktop Budget is US$69.95. Runs on 512 K.



For more information, or to order, call Gold Disk at 1-800-387-8192 or 1-416-828-0913.



GOLD DISK

P. O. Box 789, Streetsville, Mississauga, Ontario, CANADA, L5M 2C2

This entire ad was produced and color separated using Gold Disk's Professional Page.

Circle 177 on Reader Service card.

VOLUME 5, NUMBER 3

MARCH 1989

C·O·N·T·E·N·T·S



Power and purpose. Building a better system—expanding capacity, improving efficiency, adding function. And so Hardware is our focus, and we've got plenty of it.

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NOW FEED YOUR COMPUTER DELICIOUS COLORS, AT A PRICE THAT'S EASY TO SWALLOW.

Introducing the Sharp JX-300 letter size color scanner.

Our affordable, new JX-300 can scan the most appetizing color originals up to 8½" x 11." It also has a small footprint and fixed scanning bed to give you more usable desk space.

This new color scanner joins our larger, widely acclaimed JX-450, which handles originals up to 11" x 17". The JX-450 also scans 35mm slides and overhead transparencies with an optional mirror unit.

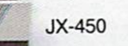
Both units scan at 300 d.p.i. resolution and 256 shades for each element to give a range of 16.7 million colors. Not to mention 256 gray scales for monochrome systems. Both are compatible with the leading PC systems.

Sharp also offers the JX-730 color inkjet printer to give you plain paper color printouts that are faithful to your originals.

If you're looking into scanners—even black and white scanners—don't overlook the future. The future is mouth watering color. For information, call 1-800-BE-SHARP.



JX-300



JX-450



Circle 250 on Reader Service card.

ZEITGEIST

A letter to the editor.

I HAD NINETY percent of my editorial written yesterday. It was all about hardware and our buyer's guide and trends and the usual sort of ramblings that I sometimes fall into when I haven't anything earth-shattering to say. This morning I was going through some mail and ran across this letter. Somehow it doesn't quite fit in Repartee, but it needed to be printed. I thought about following the letter with some kind of ending, or another address for people to write to, but I don't think it needs anything.

Guy Wright

December 12, 1988

Gentlemen:

Mr. Rick Rodriguez, President of the Miami Amigos, of which I am a member, suggested that I write this letter to your magazine to tell you about my late brother, Elier Dacal. Elier purchased an Amiga 500 computer last spring, only about four months before his death, a victim of AIDS.

Before he became ill, Elier had lived in Boston for a number of years where he played the violin with the Civic Symphony, North Shore Philharmonic, and Brookline Symphony Orchestras, and began a promising career as a composer. He studied fashion design, developing his talent in drawing and painting. He became interested in photography, combining it with his artwork, using themes from science fiction, in which he had a keen interest. When his illness forced him to return to Miami so that my mother and I could take care of him, he had to give up most of his creative activities, as a result of the disease. He had been suffering its devastating effects for about two years when he became interested in owning the computer. He wanted the chance to exercise his creativity even while confined to the house, and eventually to his bed.

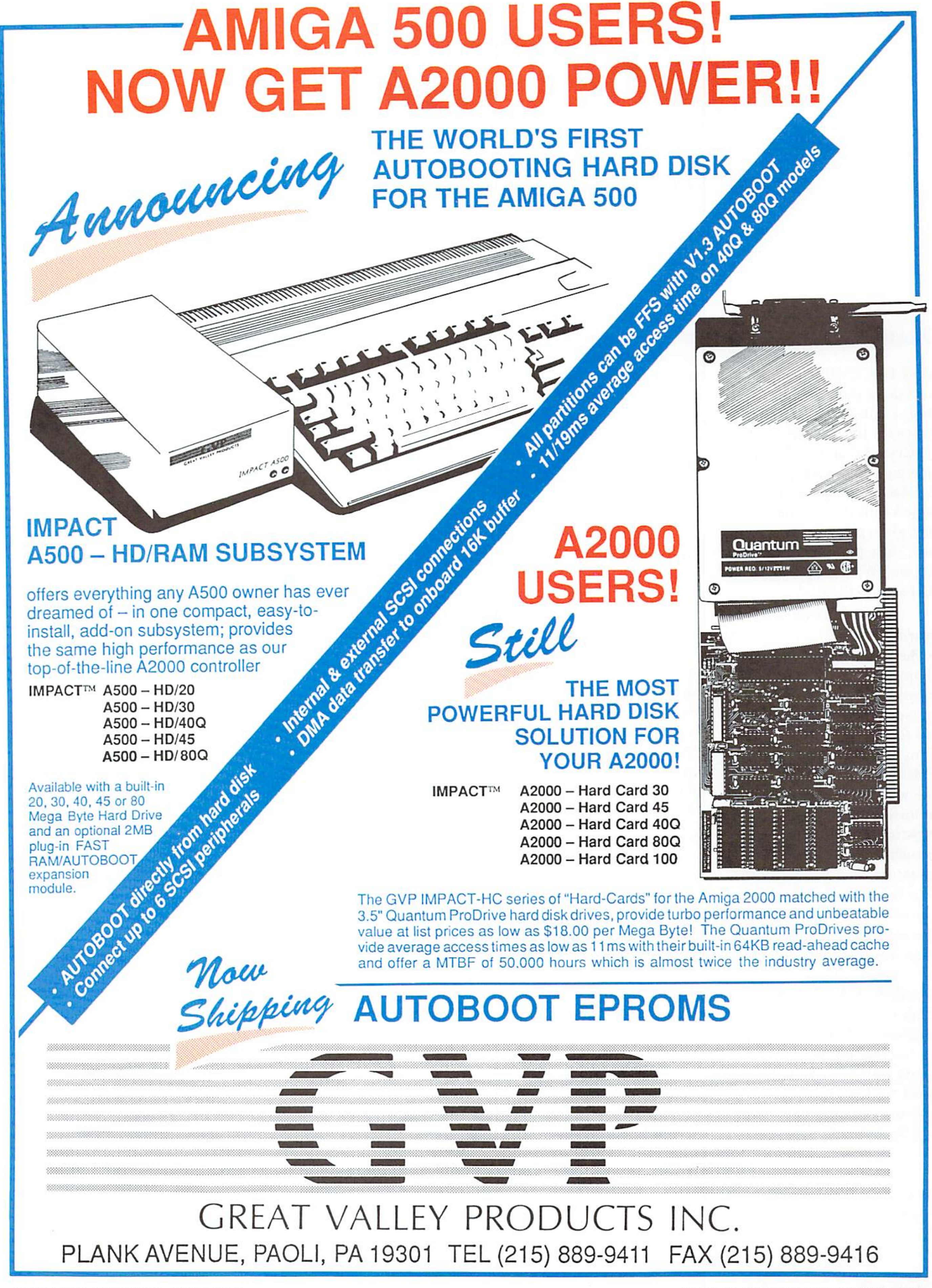
In a short time, Elier not only mastered the intricacies of the computer, in spite of excruciating pain and a rapidly encroaching paralysis, but produced a wealth of original art and music which is uniquely his and luminously beautiful. His love of science fiction and the future is reflected in much of it. My brother never resigned himself to the onslaught of the disease which was to claim his life, but thought always of the future, full of plans for his work. Even when he was no longer able to write, and lying flat on his back, using the mouse, he worked far into the night, seemingly oblivious to the pain that racked his body. By midsummer he had to be hospitalized, and on August 18, 1988, he died.

I was primarily responsible for my brother's care during his illness. He was not only my younger brother, but my dearest friend. Having shared his interest in music and art, I am able to evaluate the degree of excellence of his work. However, this remained locked in the computer after his death, as I had never found the time to learn how to operate it. Taking care of Elier had consumed all of my time. I had no idea where to turn for help. Finding the name and address of a software manufacturer among his books, I wrote to ask for the name of any resource in Miami where I might receive instruction. I received a letter referring me to the Miami Amigos and suggesting that I contact Mr. Rodriguez, which I did. He invited me to attend a meeting and become a member. At the meeting several people came forward, offering their help, and now I have access to my brother's work. I hope to be able to show some of his pictures to the group at a future meeting.

My ultimate goal is to preserve Elier's work and offer it for the purpose of raising funds for AIDS research. Some friends who knew about his valiant struggle have offered to help establish a fund, provided I can furnish them with the results of his creativity. Now, with the help of the Miami Amigos, I look forward to the possibility of achieving this goal.

Sincerely yours,

Ms. Saray Dacal
7880 Grand Canal Drive
Miami, FL 33144


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THE WORLD'S FIRST AUTOBOOTING HARD DISK FOR THE AMIGA 500
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REPARTEE

Comments, complaints, and concerns

from AmigaWorld *readers.*

DEAR MAC. . .

LAST DECEMBER, one of your sister publications, *Macworld*, listed the year's best games for the Mac. After choosing Crystal Quest as the best arcade game and best game for the Mac II, the column concluded with the comment "It's enough to make Amiga owners ditch their machines and get serious." What follows is the reply I sent to them.

Dear Sirs:

The last line of the games column in the December issue prompted me to write. Of course, to ditch my Amiga, I had to turn away from some of my other work: editing TechAlliance's Amiga magazine with Professional Page (unfortunately, since budget constraints make it a black-and-white magazine, I don't get to use ProPage's built-in color-separation generator); writing articles for the magazine with WordPerfect, and image-processing graphics for the issue with Deluxe PhotoLab. I also had to take a break from programming with Benchmark Modula-2, keeping track of my potential clients with Superbase Professional (so far I have been too busy to customize data entry with Superbase's programming language), and handling my accounting with MaxiPlan Plus (including generation of pie, line, and 3-D bar graphs of relevant data). Needless to say, with the Amiga's multitasking, I can run all these programs simultaneously; if I add more memory to my system, I could also generate ray-traced images with Sculpt-3D in the background. And that's not to mention the IBM programs I can run concurrently via the Bridgeboard. Is that serious enough for you?

P.S.: By the way, I had an opportunity to play Crystal Quest at a local store. By Amiga standards, it would be a good public-domain or shareware offering, but lags far behind even average Amiga entertainment software.

James David Walley
Bit Player Software
Everett, WA

BASIC FLAG-WAVING

WHY DOESN'T Commodore pay sufficient attention to BASIC? I know "proper" programmers write in C, but BASIC (especially when structured) has its uses. C, especially on the Amiga, is fiendishly hard to learn (I am trying!). BASIC is good for trying out a general idea for a program without investing too much effort; and for some programs, BASIC is perfectly adequate anyway.

There seems to be little development in Amiga Basic from Workbench 1.1 to 1.3, and there is still a bug in it connected with the SAY command. Loading an ILBM picture requires a long, long routine (thank you, Carolyn Scheppner, for writing one).

In the early days of the C-64, it was apparent that its BASIC was inadequate, and it was left to a lad of 16, David Simons, to fill out the commands with Simons' Basic, which was quite a success. It is time that some enterprising programmer did the same for the Amiga. We need, for a start, a "Loadpix" command. And the code for the Amiga Basic Editor should be improved: I have seldom seen such slow scrolling!

Robin Hoare
Rawene, Northland
New Zealand

BRING BACK KICKSTART

I AM DISAPPOINTED that the A500 and A2000 don't use Kickstart disks. Although it is generally convenient to just turn on the computer and put in a program disk, hasn't the Amiga lost a lot of its expandability? The ability to put in a new, revised Kickstart disk and virtually have a whole new computer at your fingertips was once a unique characteristic of the Amiga, but this is now limited to the rapidly disappearing A1000s. If the Kickstart disk is gone forever, then I wouldn't think some sort of switch between ROM chips would be too much to ask. This would keep the expandability of the A1000 with the fast loading and convenience of the A2000s and A500s.

Braddock C. Gaskill
Columbus, NJ

AMIGATEX CORRECTION

AUTHOR W. JEFFREY Blume has pointed out that we introduced an error into his article on ARexx ["ARexx: New Kingpin of Multitasking?" Nov. '88, p. 55], mistakenly referring to AmigaTeX as a public-domain program. AmigaTeX is a commercial product available from Radical Eye Software, Box 2081, Stanford, CA 94309, 415/32-AMIGA.

Send your letters to: Repartee, *AmigaWorld* Editorial, 80 Elm St., Peterborough, NH 03458. Letters may be edited for space and clarity. ■

NOTEPAD

Compiled by Linda Barrett

Holiday Cheer

THE AMIGA CERTAINLY had a happy Christmas in Britain, if last December's London show was any indication. Developers from all fields piled presents under the tree.

Holiday diversions came from several sources. Telecomsoft (01-379-6755) offered three. In **Fish** (designed by Magnetic Scrolls), you play a goldfish trying to save the planet. Wargamers have plenty of ammunition with the **Universal Military Simulator** (released in the US by Rainbird Software: 415/322-0900) and **Tracker**, a combination of strategy and arcade sequences. Reports from Mediagenic UK (UK: 01-431-1101, US: 415/329-0800) indicated that **Afterburner** is finished and eagerly awaited throughout Europe. A conversion of **R-Type** is the next blast-'em-up on the schedule. Microdeal (UK: 07-256-8020, distributed in the US by Michtron: 313/334-5700) displayed **International Soccer**, a promising simulator, **Turbo Trax**, a racing game in which you can design your own circuits, and **Fright Night**, a arcade-adventure game. Precision Software (01-330-7166) left smoking joysticks behind with **Charon 5** (distributed in the US by Mindware International: 705/737-5998).

Capturing the sounds of the season were Microdeal's **Midi Interface** and **Sampler Box** and Trilogic's (02-746-91115) low-cost **audio digitizer**. For playback, Trilogic offered small amplifiers to drive headphones or speakers from your Amiga. The company was also seeking a US distributor.

To catalog all your new goodies, Precision Software suggested **Superbase Personal 2** (distributed in the US by Precision Incorporated: 214/929-4888), which adds mail merge and a text editor to its database capabilities.

Already established in the states, Supra's **hard drives** and **modem** are now being distributed in the UK by Frontier Software (04-236-7140). A less fortunate hardware manufacturer was Robtek, which has ceased trading. Club 68000 (01-977-9596) has taken over much of Robtek's old business.

While most developers were keeping their plans for 1989 under wraps, Commodore was pledging continued success. The Amiga 500 is now the de facto upgrade path for C-64 owners.

—Stu Menges
Middlesex, England



One of three Amiga-based information booths in Oslo, Norway.

Oslo in a Box

FOR LOST SHOPPERS, the InfoBox is a savior. If you know what you want to buy, it will tell you where to find it and how to get there. More than a map, the box can plot your route for you.

The metal box houses an Amiga-based information booth. The shopping-center version greets you with a slideshow. Press any key to see the main menu, from which you can request information on various types of shops, restaurants, and facilities. If you choose restaurants, for example, a three-second restaurant-related advertisement plays, then a list of restaurants appears. Select an entry and press the enter key to see a picture of the establishment, a menu, or a price list. Press the enter key again for a map of the mall with restaurants marked by flashing dots.

The city box improves on the process. If you are interested in pet shops, for example, you can request the name and picture of the closest one. A map follows displaying your position and the pet shop's, then a detailed map pinpointing the pet shop. Press the enter key once more for a list of public transportation that will take you to the shop.

For designer Martin Joyce Nygaard of Oslo, Norway, the InfoBox is a rapidly growing business. He offers two configurations—the boxed version powered by a one-megabyte A500 with a 40MB hard disk and a 1081/84 monitor, and a store-window version powered by an A2000 with a 20MB or 40MB hard disk. Five keys connected to the joystick port control the box-based system, while heat or light sensors glued inside the window control the A2000-based system. Both were programmed in C. The retail price is a hefty £5000, but Nygarrd splits the advertising revenue with the box owner.

Three InfoBoxes are currently in operation—at the Norwegian State Branch of Public Information, the Center for Public Transport, and Norway's largest shopping center. For more information, write to Martin Joyce Nygaard at: InfoBox A/S, Skippergt. 27, 0154 Oslo 1, Norway, or call 047-233-3250.

—LJB ■

REVIEWS

FLEET CHECK
GOLD SPELL II
ZING!SPELL

Polish your prose with a backseat speller.

By Neil Randall

FEW THINGS CAN be as damaging to a document's credibility as a misspelling. Three spell-checking programs—Fleet Check by Professional Software, Gold Disk's Gold Spell II, and ZING!Spell from Meridian Software—are designed to bolster your image.

Each of the programs I reviewed takes a different approach. Fleet Check works in real time, alerting you to errors as you type. Gold Spell II is a batch checker; it examines your document after you have finished typing. Positioned square in the middle is ZING!Spell, which operates in either real-time or batch mode. Of the three, only Fleet Check adds a thesaurus, although mailing in the registration card for Meridian's ZING!Spell entitles you to a free one. The lack of a strong thesaurus in all programs comes as something of a surprise, as thesauri are commonly bundled with spell checkers in other computer environments.

FLEET CHECK

Fleet Check's manual clarifies the program's function immediately. "Please note," it reads, "that Fleet Check will not be able to spellcheck documents already stored on disk. Its only purpose is to spellcheck as you type and to allow you to access the Thesaurus." For many users, that statement renders the package useless, as spell-checking after the fact is often the preferred method. More disturbingly, this contradicts a statement on the front of the package: "Documents can be checked while you're typing or when completed."

Fleet Check contains a 90,000-word dictionary. A separate, customizable dictionary can accommodate 10,000 additional words. When you enable the auto-spell mode, both dictionaries load into memory; the program scans your document for misspellings and finds substitute words quickly. Although the manual suggests you load Fleet Check before loading the word processor, this isn't really necessary as long as your word processor allows access to the Workbench window. A warning, though: I had trouble both post-loading and pre-loading Fleet Check in conjunction with WordPerfect (WordPerfect Corp.), Kind Words (The Disc Company), and TextPro (Abacus) on my Amiga 500 with 512K. With a one-megabyte A2000, the problem disappeared.

As soon as you type a word that is not in Fleet Check's dictionary, your screen flashes and the speaker clicks. If you want to correct it, hit the two shift keys simultaneously. Then, at the top of the screen, the Fleet Check window appears with an array of up to eight suggested corrections. You now have four choices: Use the mouse to select one of the words, type in the correction, add the word to your dictionary, or hit the return key to stop Fleet Check from noticing the word for the remainder of the writing session.

Unfortunately, the four-page manual points up almost as many conditions as features. First, your incorrect word is kept in memory only as long as you don't type more than 60 characters (one normal line) afterwards. Another condition is that Fleet Check "can get lost in your text and will not be able to reinsert the [correct] word" if you invoke menus, function keys, ALT- or CTRL-key sequences, and so on, before calling up the incorrect word. To make things worse, you must be in Insert mode, and your text must not be justified or centered. Finally, the program can get lost all on its own if you type several misspelled words consecutively.

Fleet Check's usefulness is limited. Its thesaurus is passable, and it works well as a simple word-by-word checker, but it needs a good deal more development.

GOLD SPELL II

Like Fleet Check, Gold Spell II loads entirely into memory, thereby maximizing speed. One highly-commendable feature is its specific support for Amiga word processors. You can select a format for WordPerfect, Textcraft and Textcraft Plus (Commodore), Scribble! (Micro-Systems Software), ProWrite (New Horizons Software), the Amiga Notepad, and Gold Disk's Professional Page or PageSetter. Choosing the Generic format lets you check ASCII files produced with any program.

Gold Spell II contains a 90,000-word dictionary, and offers three application options for checking completed documents. You can check the spelling of an individual word (this is useful if you have Gold Spell II multitasking behind your word processor). For interactive checking, the program shows you each misspelled word as it appears in the document, and allows you to fix mistakes immediately. With Batch method, Gold Spell checks the document and stores

A spelling checker can save you from having to eat your words.

suspect words for you to correct later.

The second, Check Document, is the most useful method. When Gold Spell II finds an incorrect word, its screen splits in half. The top shows the word in its context of several surrounding lines. At the bottom, the Check Document window displays a series of options. You can click in the text string and correct the word manually, or you can click Accept to change nothing. If you select Accept and Remember, Gold Spell will ignore future occurrences of that word and keep it in memory to be saved later as part of your customized dictionary. You can also check the dictionary itself: Selecting Scan Dictionary lets you search the dictionary for the word you want, while choosing Guess Spelling asks Gold Spell to do the work for you. (I tested Guess Spelling with 50 misspelled words, and the program replaced 40 correctly, certainly a good percentage.) A final option lets you list a word as one to be substituted with another word later. If you habitually misspell a certain word, or you like to abbreviate as you type, the substitute feature is extremely handy.

Batch mode checks the spelling of a file non-interactively. You simply select Batch from the Project menu, then go for a 5- to 10-minute walk. When you return, the Batch Mode window will show the number of incorrect words found, and will give you the option of editing these words immediately or saving the list. Choose Edit, and the words appear, one by one and (unfortunately) without surrounding context. At any time, you can quit and return to the same spot later. Apart from the lack of context, the system works very well.

As with the other two checkers, Gold Spell II's dictionaries are alterable, either via the Accept and Remember option or by using a word processor capable of saving ASCII files. You can create customized dictionaries and define substitute files for various uses. Gold Spell even lets you load an Exception file, which lets you list words you want Gold Spell *not* to recognize.

Gold Spell II can deliver document statistics, including the number of words and sentences in the piece and the approximate grade level of readability (Gunning Fox Index). A final statistic isolates the number of unique words in the document, letting you check for overuse of specified words.

ZING!Spell

Without doubt, ZING!Spell is the most feature-laden of the three packages. Besides supporting ARexx commands, the program has four separate real-time spell-checking options. You can check words whenever you choose, or set the system to check after a carriage return, only the last word entered, or each word as it is typed. ZING!Spell lets you work in either Workbench-screen or custom-screen modes.

ZING!Spell lets you create exchange dictionaries—specify and type abbreviations for longer words, and the program will automatically substitute them in the text. You can also create and edit custom dictionaries. The checker can be suspended at any time, and you can scan the dictionaries for spelling suggestions. Finally, you can check as you type, or you can check a finished document.

In practice, the checker does little to help you find substitutes for misspellings. It alerts you to errors, but of the 30 samples I tried, the dictionary gave me correct spellings for only ten. The reason is that ZING!Spell uses a wild-card system to help you locate words automatically—and this rarely does what you want. You can manipulate the misspelled word to help the dictionary find the correction, but using a traditional desk dictionary is preferable. ZING!Spell works in identifying typos, but not very well as a spelling corrector.

Although the program becomes easier to use with practice, ZING!Spell is initially slow and awkward to use. In this regard both Fleet Check and Gold Spell II are superior; their manuals and interfaces help instead of impede. ZING!Spell's manual is the worst I have seen in three years. As if dot-matrix-printed documentation isn't hard enough to read, the manual has almost no perceivable organization, and its instructions are very poor. If you want a highly-versatile checker, buy ZING!Spell, but be sure you have the technical know-how to make it work.

Spelling It Out

Most writers, programmers, and other applications-users—spell checkers aren't just for word processing, after all—will be happiest with Gold Spell II. It helps ►

you correct finished documents quickly and easily, and its dictionary options and statistics are useful. ZING!Spell, on the other hand, is useful for the technically-adept looking to customize their utility. I recommend Fleet Check only for poor typists and poor spellers.

Fleet Check
Professional Software Inc.
51 Fremont Street
Needham, MA 02194
617/444-5224
$39.95
No special requirements.

Gold Spell II
The Gold Disk
2179 Dunwin Dr.
Mississauga, Ont.
Canada L5L 1X2
416/828-0913
$44.95
No special requirements.

ZING!Spell
Meridian Software Inc.
9361 W. Brittany Ave.
Littleton, CO 80123
303/979-4140
$79.95
No special requirements.

MIDI Magic

Saw measures in half and make notes disappear.

By Bob Lindstrom

WHILE MOST OF its competitors employ proprietary-interface designs, MIDI Magic, a 16-track sequence-and-song editor, consistently adheres to the Intuition style. This factor contributes ease of use to MIDI Magic's features, but, in some cases, it also impedes the efficiency of an otherwise smooth-running program.

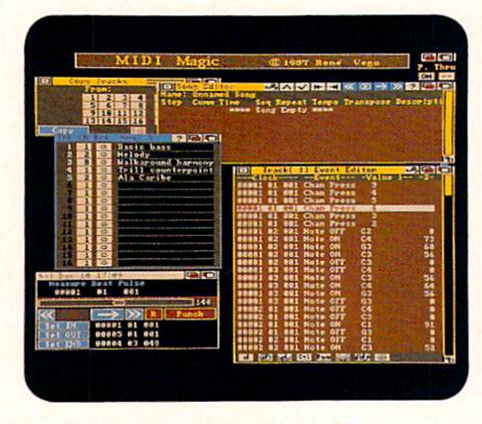
MIDI Magic provides track-, sequence- and song-editing modes. Each mode functions in a separate window, all of which may be present on the screen at once. Because overlapping windows can clog the screen, the program lets you shift from a medium- to a high-resolution display that shows more data with less confusion. The drawbacks are interlace flicker and extra RAM overhead.

For My First Trick...

MIDI Magic offers 26 sequences, each with 16 tracks. Composing typically begins by choosing a sequence, A through Z, and entering the Tape Transport and Track Display to start recording. The Tape Transport contains typical tape-recorder-type controls (play, record, fast forward, and fast backward), a counter for current measure, beat and pulse location, and punch in and out settings for re-recording segments.

In the Track Display, you select a track, place it in Record mode, and click the Record button in the Tape Transport window. At that point, you can set an audio-visual metronome to click and flash the tempo.

In addition to a Tape Transport slider that lets you set a tempo manually, the Set Tempo menu option lets you choose



MIDI Magic's interface is purely Amiga.

the music's speed by rhythmically hitting a synthesizer key or the Amiga's space bar (the computer tracks the strokes and automatically sets the tempo). Although the space-bar option proved totally reliable, I found this feature prone to MIDI error when accessed from the synthesizer keyboard.

Those who demand the utmost in MIDI clock accuracy will be delighted with MIDI Magic's clock-pulse options. You can choose clock rates from the common 24 PPQN (pulses per quarter note) to 480, and a Custom option lets you dictate any unusual PPQN your rhythmic heart desires. MIDI Magic contains an internal clock, and it is compatible with an external MIDI clock (invaluable when porting sequences from other systems), step-time note entry, and drum sync output.

MIDI Magic's solution to the chronic MIDI-recording problem of stopping the "tape" precisely at the end of a measure is one of the best I have seen. In the Tape Transport window, you click the time counter to one pulse beyond the end of your track (usually, it will be the first clock of the next measure). Then, clicking on a Set End button automatically extends or cuts the track to that length. After you've recorded a few tracks, you can use the Track Edit options to copy and combine (bounce) several tracks into a single track, to Global Delete specific types of MIDI messages from all tracks (remove all MIDI velocity or aftertouch data, for instance), to manually enter System Exclusive and other specialized MIDI commands, or to quantize the rhythms.

Split-Second Timing

Quantizing (aligning and correcting rhythmic values) is particularly flexible in MIDI Magic. Several techniques are available, and you can quantize to any value from half notes to 32nd-note triplets. Note Coherent will preserve the note duration but shift the beginning to the quantize point. Note Duration retains the note on position but alters the note's length. Note On Only retains the note off position but changes note on to the quantize point. Finally, On & Off shifts both events to the nearest quantize point.

Unfortunately, the program does not have an Undo feature, and it will not automatically back up a track prior to quantization. If you might want to return to a particular version of a track, you should copy it.

In the Track Event Editor window, you alter or insert individual MIDI values in a track. To alter values, you must hold the left mouse button down over the desired number or note value on screen, then roll the mouse left and right to change the entry. If you prefer typing in new values, the mouse method may seem sluggish and inconvenient. There is no keyboard option, however.

Another complaint about the Event Editor is that it displays MIDI data be- ►

ginning only with the current position of the Tape Transport. If you stop the transport in measure three at beat one, the Track Edit window does not display any MIDI track data in the first two measures; you have to "rewind" the Tape Transport to view the entire track.

After you record as many of the sequence's 16 tracks as you need, you move through any remaining sequences until you complete all the segments. At that point, you go to the Song Editor window and assemble your sequences into a score.

When assembling a song, you can repeat a sequence up to 99 times, transpose it to another key, and change the tempo. The Song Editor window displays values for these options as well as the elapsed time, and any comments that you may have attached to the sequence.

MIDI Magic's song-building design is logical, but not very flexible. You cannot compose a single drum pattern and mix and match it among several sequences, for example, because tracks must remain within their assigned sequences. Also, while you can place completed sequences in any order in the Song Editor, only one sequence can play at a time. The inability to combine or overlap sequences is an unfortunate limitation.

They Do It with Mirrors

Although reliable design and operation is the norm in MIDI Magic, the program has a few eccentricities. As the documentation warns, program execution can be slow, especially when several windows are open at once. Menu selection tends to lag, too, with the cursor hesitantly jerking from one menu option to the next.

A glaring omission is the inability to save sequences in the MIDI-file standard. Now that the standard is in place, every MIDI sequencer should support it. This omission precludes MIDI Magic from participating in inter-program and inter-operating system trading of MIDI data.

While the printed manual has a helpful—albeit brief—tutorial, the disk contains only a trio of crude demo sequences. With about 35 percent of the disk free, there was plenty of room for example songs and sequences to help the beginner get started.

Lastly, aside from function-key equivalents for Tape Transport commands, MIDI Magic is short on keyboard substitutes for mouse and menu operations. More keyboard control would make the program faster to use and far more flexible, particularly for the experienced MIDI musician.

MIDI Magic has a few finishing touches, however, that other programs do not. Those willing to tinker with the tools selection in the Workbench Info window can customize MIDI Magic to boot up in virtually any configuration; you can select colors, clock source, screen resolution, metronome setting, default PPQN, and more. The manual is quite clear and to the point, and, although some efforts to be entertaining are cloying, its glossary of MIDI terms and an appendix with sections on troubleshooting, error messages, technical pitfalls, and a listing of program-supported MIDI specifications are helpful. Best of all, MIDI Magic is not copy-protected; the manual provides complete instructions for installing and running the program on a hard disk.

The Final Curtain

MIDI Magic offers much that Amiga sequencers in the $200–$300 price range do. Professional MIDI musicians who put a premium on speed and efficiency (and not on mouse-and-menu consistency) will want to pay the price for a more advanced package, but many beginners and serious amateurs will love MIDI Magic for its power and its start-up familiarity. Finally, because Circum Design promises a patch librarian add-on module, MIDI Magic may become a one-stop MIDI solution for many Amiga musicians.

MIDI Magic
Circum Design Inc.
Distributed by Brown-Wagh Publishing
16795 Lark Ave.
Suite 210
Los Gatos, CA 95030
408/395-3838
$149.95
MIDI synthesizer, MIDI interface, and two MIDI cables required.

Reviews continued on p. 84

BASIC By The Numbers

Part Three of our four-part saga on data manipulation helps you find a needle in a haystack.

By Bob Ryan

72 THE STORY THUS FAR

IN THE PREVIOUS two installments of BASIC By The Numbers, you've learned to store and sort data. This month, I continue to expand the address book sample program by introducing another data manipulation technique: searching.

For newcomers, here are the two component programs of the address book application. (See January '89, pg. 24 and February '89, pg. 20 for explanations.)

```
REM Address Book Create/Input Data Program
OPEN "Address" FOR APPEND AS #1
GetData:
  CLS
  INPUT "Last Name (RETURN to exit): "; last$
  IF last$="" THEN Finish : 'quit on NULL string
  INPUT "First Name: "; first$
  INPUT "Street Address: "; street$
  INPUT "City: "; city$
  INPUT "State: "; state$
  INPUT "Zip: "; zip$
  INPUT "Phone: "; phone$
  WRITE #1, last$, first$, street$, city$, state$, zip$, phone$
  GOTO GetData
Finish:
  CLOSE #1
  END
```

```
REM Address Book Read and Sort Data Program
REM File Reading Routine
OPTION BASE 1
DIM lst$(100,7) : 'limit 100 records in address book
OPEN "Address" FOR INPUT AS #1
WHILE NOT EOF(1)
  rec=rec+1
  FOR fld=1 to 7
    INPUT #1, lst$(rec,fld)
  NEXT fld
WEND
CLOSE #1
REM Sorting Routine
Bubble:
  flag=0
  FOR x=1 to rec-1
    IF lst$(x,1) > lst$(x+1,1) THEN
      FOR z=1 to 7 : 'If out of order...
        temp$(z)=lst$(x,z): '...swap!
        lst$(x,z)=lst$(x+1,z)
        lst$(x+1,z)=temp$(z)
      NEXT z
      flag=1 : 'set when a swap has occurred
    END IF
  NEXT x
  IF flag=1 THEN Bubble : 'If a swap occurred, do it again
CLS
FOR x=1 to rec : 'Display the sorted records
  FOR fld=1 to 7
    PRINT lst$(x,fld); " ";
  NEXT fld
  PRINT
NEXT x
END
```

73 THREE-PART HARMONY

ONE OF THE primary functions of an address book program is to let you find the address or phone number of a particular person. While the above program displays the address book's records sorted alphabetically, it isn't very useful for finding information about any one person, once the address book has more entries than will fit in one Amiga window. As your address file grows, you need a more sophisticated method to call up specific data.

A search routine consists of three components: an input segment where you specify the information you want, the actual search segment, and a segment that displays the information. We'll tackle each of these in order. ►

The input segment of the search routine can be very simple: You prompt the user to enter the last name of the person he or she wants information about. Here is an example:

```
REM 'Search Input
SearchIn:
  CLS
  LOCATE 10,10
  PRINT "Address Book Search"
  INPUT "Enter Last Name: "; search$
```

The simplest search algorithm is brute force: You examine every record in the list until you find a match. For example:

```
found_flag=0
FOR x=1 to rec
  IF lst$(x,1)=search$ THEN
    found_flag=1
    GOTO CheckFlag
  END IF
NEXT X
CheckFlag:
  IF found_flag=1 THEN
    DisplayIt : 'jump to the record display routine
  ELSE
    PRINT "Record Not Found"
  END IF
```

This routine works but it is neither efficient nor very pretty. If you have 80 records in your address book, the program will have to perform an average of 40 comparisons before it finds the proper record. To greatly decrease the average number of comparisons needed, I rely on a binary search.

In a binary search, you examine selected records that continually narrow down the number you must examine. A binary search is very efficient, but it does require that the records be sorted.

Here is how a binary search works. Let's say you have a list of 20 records and the record you want (though you don't know it) is number 14. First, you compare your search string with the record halfway down the list, namely 11. Because the search string is below record 11 alphabetically, you check the record halfway down the remainder (records 12 through 20) of the list, namely record 16. The search string is above this record, so you check the record (13) halfway between the remaining records (12 through 15). Your search string is below 13, so you move halfway down the remaining records (14 and 15) to record 14, where you finally have a match. In your search, you've examined records 11, 16, 13, and 14, for a total of four. A brute force search of the same list will take an average of 10 comparisons.

The routine below implements a binary search for the address book program. Remember, the records are numbered from 1 to rec. The display routine follows the search routine.

```
lo=0 : hi=rec
Loop:
  lookup=lo+INT((hi-lo+1)/2)
  IF search$=lst$(lookup,1) THEN
    GOTO DisplayIt
  ELSEIF search$ < lst$(lookup,1) THEN
    IF hi=lookup THEN EndSearch
    ELSE
    hi=lookup : GOTO Loop
  END IF
  ELSE
    IF lo=lookup THEN EndSearch
    ELSE
    lo=lookup : GOTO Loop
    END IF
  END IF
EndSearch :
CLS
PRINT "No Match Found!"
INPUT "Try Again (Y/N) "; ans$
IF ans$="Y" or ans$="y" THEN SearchIn
STOP

DisplayIt:
  CLS
  LOCATE 1,10
  PRINT "The record you want follows:"
  FOR fld=1 to 7
    PRINT lst$(lookup,fld); " ";
  NEXT fld
  PRINT
  INPUT "Search Again (Y/N) "; ans$
  IF ans$="Y" or ans$="y" THEN SearchIn
  END
```

To get everything working, add the above routine to the Search Input routine and tack the whole thing onto the end of the Read/Sort program. You now have the basic pieces of an address book application.



74 Fond Farewell

NEXT MONTH, IN the final installment of BASIC By The Numbers, we'll add menus, a print routine, and error trapping to the program to create a finished application. ■


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Hard Times Ahead

Greater storage capacity, efficiency, and speed make hard drives the standard of the future. But what kind of system do you need and how do you install it?

By Louis R. Wallace

MUCH TO MOLLY'S DISGUST, but radio listeners' delight, Fibber McGee's closet could hold a lot, but attempting to locate one thing brought the entire contents cascading down on his head. The same applies to your desk littered with floppy disks; you know the program you need is there, but finding it means rooting through the mess.

A more efficient storage method is a hard drive. A 20MB hard drive will hold the equivalent of 20 floppy disks in one neat box. Instead of searching for separate disks, you can install frequently used software on your hard disk, then click open the programs as you need them. Accessing programs from a hard drive is also much faster than accessing them from a floppy. For disk-intensive applications, such as searching and sorting databases, spell checking large documents, creating graphics, or digitizing sound and video, you will quickly appreciate the increased speed of a hard drive. (For more details on how a hard drive operates, see the sidebar "Hard Facts.")

Purchasing and installing your first hard drive, however, presents an array of bewildering choices. What capacity do you need? What size do you buy? What interface standard should you use? How do you hook it up? Because the answers are system specific, we will concentrate on adding an internal hard drive to an Amiga 2000 running version 1.3 of the operating system.

While your Amiga comes equipped to run a floppy drive, you must buy an Amiga-specific controller card to run a hard drive. Because of manufacturing costs and expensive extras, such as autoconfig and DMA (Direct Memory Access) circuitry, the controller often costs more than a 20MB drive.

Many companies, such as C-Ltd and Supra Corp., offer turnkey hard-drive systems, containing the drive, a controller card, mounting hardware, cables, software (a hard-disk driver and installation program), and instructions. The all-in-one package is perfect if you do not want or know where to search for individual components. With all the pieces coming from the same company, troubleshooting is much easier.

If you want to get the best deal possible or a custom configuration, you can easily buy the components from different sources. While you can save money or buy more megs for the same amount with this method, you run the risk of assembling incompatible components. The best defense is to know your interface standards and your personal requirements.

How Much Is Enough?

One such requirement is the storage capacity you need. Although 20MB drives are the least expensive, they have the highest cost per megabyte and fill all too quickly. While your first 20 megabytes may cost about $500, doubling your storage to 40 megs will cost only about an additional $100. The per-megabyte savings increase as you move up to 60MB, 80MB and 100+MB systems, although you will probably want to draw the line on capacity somewhere. If your budget will allow it, I recommend you buy a 40MB drive at least.

ST506 vs. SCSI

All Amiga hard drives adhere to either the ST506 or the SCSI (Small Computer System Interface) interface standard. Designed for the IBM PC, ST506 ►



PHOTOGRAPHED BY LARRY DUNN

drives are the cheapest and most plentiful. SCSI drives cost a little more, but are usually faster than ST506 drives. Commodore's A2090A interface card supports both ST506 and SCSI drives; most other controllers support SCSI drives only. If you need the flexibility of using both types of drives, get the A2090A. If you do not need ST506 support, get a SCSI-only interface.

$3^1/_2$ vs. $5^1/_4$

Once you decide on a standard, consider the size of the drive—$3^1/_2$ inch or $5^1/_4$ inch. You must install a $5^1/_4$-inch drive in the $5^1/_4$-inch-drive slot on the A2000. This, however, prevents you from running MS-DOS programs via Commodore's A2088 Bridgeboard, because it eliminates the space for an internal IBM-compatible drive. A $3^1/_2$-inch drive installed in the second floppy slot means having only one internal floppy drive, DF0:. You could add a more expensive, external $3^1/_2$-inch floppy, which is called DF2: by default but which you can mount as DF1:. If you want two internal $3^1/_2$-inch floppies and a $3^1/_2$-inch hard drive, but no MS-DOS floppy, you can install the hard drive in the $5^1/_4$-inch slot with a mounting bracket. Radio Shack sells one for $29.95.

DMA vs. Non-DMA

For even more speed and efficiency, consider a controller that supports DMA (Direct Memory Access), a hardware technique for high-speed data transfer between computer memory and a device, such as a hard disk. Once the CPU has initiated a DMA transfer, transmission continues without further assistance from the CPU, meaning your Amiga can perform other functions while accessing your drive. Again, performance adds to the controller's price. If speed is a major concern, I recommend investing in a DMA controller.

Remote Control

Version 1.3 of the operating system adds a new option—autobooting AmigaDOS from your hard drive. When autobooting, the machine executes your startup-sequence automatically from the hard disk, instead of looking for it on a floppy disk in DF0:. To autoboot from your hard drive you need Kickstart 1.3 and a controller card that supports the procedure. Because Commodore is not selling the Kickstart 1.3 ROM chip (part number 315093-02) to users, you must have a service center install it for you. Several reliable autobooting hard-drive controllers are the A2090A (Commodore), the A2000 Impact (Great Valley Products), the A2000 SupraDrive controller (Supra Corp.) and the A2000 Overdrive controller (Pacific Peripherals).

Out of the Box, Into the Case

With all the components collected on your desk, you are ready to install your hard drive. The exact procedure depends on your specific controller and drive. ►

Glossary of Hard Drive Terminology

AutoConfig—a technique used by the Amiga operating system to automatically recognize and access hardware. Autoconfig devices must meet certain requirements before the Amiga can detect them.

Block—a segment of data totaling 512 bytes.

Cylinder—a group of tracks with a common track number. All the track 0's on a hard drive form one cylinder, all the track 1's make up another, and so on.

Device—is a software I/O port that AmigaDOS uses to communicate with a physical I/O port or a redefinition of how a system resource is used. For example, the RAM: device redefines read/write memory to be a disk drive.

Device Driver—the program and data structures necessary to make a device functional.

DMA—Direct Memory Access; a high-speed method of transferring data between RAM and a peripheral device, such as a hard drive.

DOS—Disk Operating System; the software the computer uses to control the disk drive.

File System—a program that provides high-level access to low-level mass-storage devices.

Handler—a translator that lets you access different logical devices with the same commands, such as RAM-Handler, SPEAK-Handler, and AUX-Handler.

Mountlist—a text file found in a Workbench disk's DEVS: directory that describes devices, handlers, or file systems added to the system with the AmigaDOS MOUNT command.

Partition—the division of a single hard drive into two or more "logical" segments that the system refers to as if they were individual drives. Partitions are formatted independently and can each support a different disk operating system. For example, one drive could house partitions supporting AmigaDOS, FastFile-System, and MS-DOS.

Read/Write Head—a circular piece of magnetized iron positioned above the magnetic media that is used to read or write data to the drive.

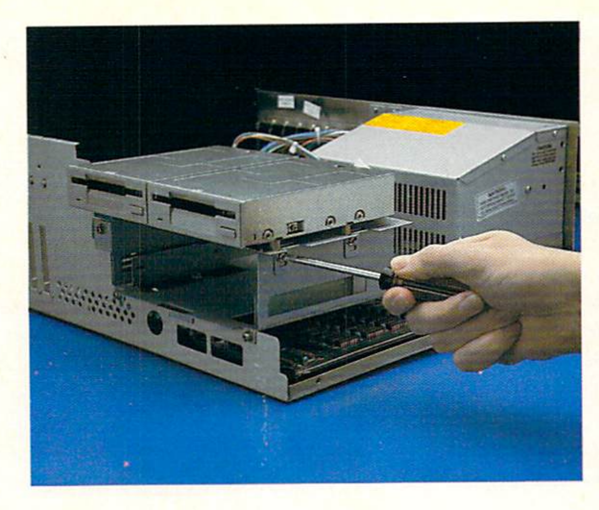
SCSI—Small Computer System Interface; a high-speed interface capable of the parallel transference of data (transferring eight bits at a time).

Sector—a sub-area of a track.

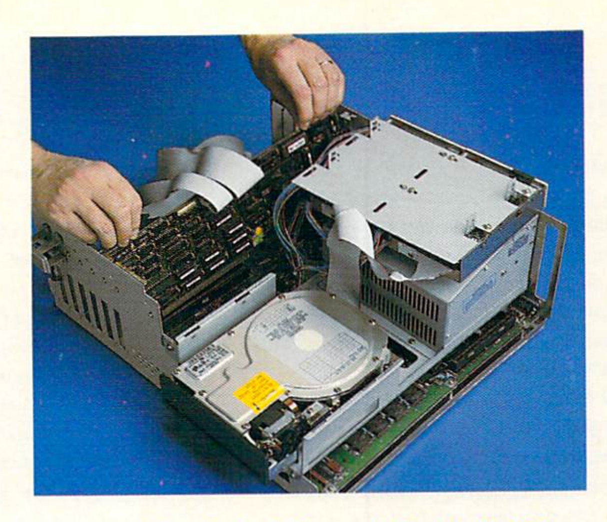
ST506—an interface that uses serial transference of data (transferring one bit at a time).

Startup-sequence—a text file that contains instructions for the Amiga to execute when it is booted. Startup-sequences are stored in the S directory of boot disks.

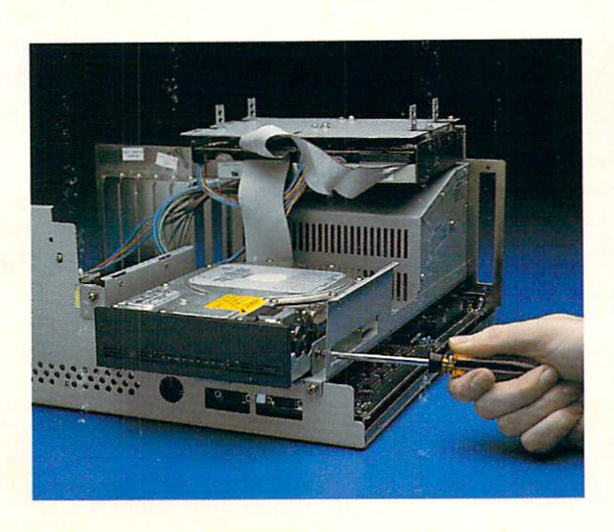
Track—one of many rings on the surface of the disk that the read/write head of the drive passes over.



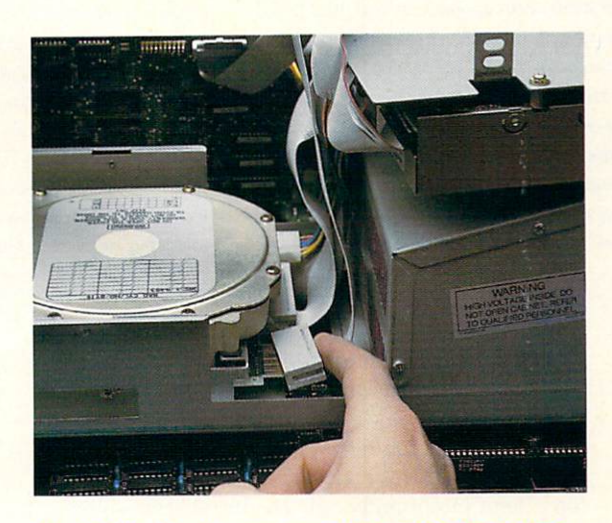
Step 1. Removing the floppy-drive plate.



Step 3. Installing the hard-drive controller into the first Amiga slot.



Step 2. Installing the hard drive in the 5¼" mounting bracket.



Step 4. Attaching the power and data cables to the hard drive.

Hard Facts

A HARD DRIVE is a mass-storage device onto and from which your Amiga can store and retrieve information. Conceptually, a hard drive is similar to a floppy drive. Both contain rapidly-spinning (3600 revolutions per minute for a hard disk, 300 rpm for a floppy) magnetically-coated disks that hold information.

Hard drives offer higher storage capacity and data-transfer speed, however, making them more desirable and expensive than floppy drives. Capacities range from 20 megabytes (the equivalent to over 20 Amiga floppies) to over 130 megabytes (as much as 150 floppies). Of course, hard storage costs more than floppy storage. A 20MB system costs $400–$600 (or about $25 per megabyte), while 20 floppies at a total cost of $40 represent a cost per megabyte of only $2. The more hard storage you buy, however, the less you pay per megabyte. A 40MB system at $700 means the per-meg price drops to $17, while an $800 60MB system brings that price down to $13.

Although storage capacity is easy to measure, hard-drive speed is more complex. One aspect of speed is *seek time*. When you want to read or write to the drive, the computer's disk operating system (DOS) determines the proper track and sector on the disk and moves the drive's read/write head to that location. The amount of time required to move the head is called seek time. A better way of measuring drive speed is with *access time* (measured in milliseconds), the average amount of time that elapses between the computer's request for data transfer and data's return. Hard-drive manufacturers usually quote the access time.

How the hard-drive interface sends the data from the drive to the computer affects the drive's speed. ST506 drives send information one bit at a time, while SCSI transfers a full byte at a time. The SCSI method is usually the faster. □ *—LRW*

Care and Feeding

THE TWO BIGGEST problems for hard-drive owners are direct opposites—loss of data and data buildup. Unless you take the proper precautions, you could lose all your data in a disk crash, or you could waste access time while your disk searches through unnecessary files. The best way to avoid these situations is to prepare yourself against them.

Hard drives are powerful, but not indestructible. If you make a mistake, software corrupts the drive, or the hardware breaks down, you will lose your data. The golden rule is: Always back up your data onto floppy disks. You should back up your data files after every computing session. While you can recopy programs from their original disks, data can be lost for good if you do not save it regularly. Because backing up the entire drive is time consuming, you need to do so only once a month.

If your data files are few and small, you can back them up using the Workbench or CLI. Use Duplicate for the Workbench menu to make a copy of the files, then drag the icons into the floppy disk's window. From the CLI, use the COPY command.

This method quickly becomes time consuming when you have enough files to fill one or two floppies. A better alternative is to batch copy files with a directory utility program, such as CLImate, DiskMaster (both from Progressive Peripherals & Software), and DirUtil (public domain). These programs let you copy groups (batches) of files, such as entire directories, with a single command.

If you have megabytes of data to back up, you should invest in a more sophisticated backup program, such as QuarterBack (Central Coast Software), or a tape backup system, such as C-Ltd's. The programs allow you to copy the entire contents of your hard drive to floppies. Once the process is started, all you have to do is supply fresh floppy disks when prompted. Be prepared, a 20MB drive will require about 25 floppy disks to store all the data, and it will take you one to two hours to make the backup. With a tape backup system you can copy the contents of large hard drives to magnetic tape for archiving or safeguarding far faster and more easily than you can back up to floppies. The drawback is that tape drives are expensive, sometimes rivalling hard-drive costs.

Neat-Nik

Just as backing up your drive will rescue you from disaster, keeping it organized will save you from frustration. New hard-drive owners often use only a few directories to store a vast array of data. Besides making it difficult for you to find anything, it slows down your drive, as the computer must search through the clutter for your requested data.

To keep your drive as efficient as possible, keep it organized. Make your root directory lean. Keep only what you need in it, with the rest in subdirectories. A good guideline is no more than 20 to 30 files per directory. Organize your files and programs under common themes—graphics, word processing, games, and so on. Delete files you do not need. Some disk utilities, such as CLImate and DiskMaster, offer housekeeping routines to make the process easier. □

—LRW

What follows is a general guideline; always consult the installation instructions accompanying your system.

If you choose an ST506 system, check your hard disk and its packaging for a chart of the disk's bad sectors (if any). If the values are listed on the drive, copy them into a notebook; the installation software may request them.

To physically install the drive, turn off your system and remove all the connecting cables. To open the A2000's case, remove the two screws on each side and the top, center screw in the back.

To install a 3½-inch drive, remove the two screws on each side of metal plate to which the floppy drives are attached. Carefully lift up the plate, with the floppy drive still in place, and find the screw holes in the plate for your hard drive. Attach the drive, and screw the plate back in place.

To install a 5¼-inch drive, simply slide it into the bottom slot, align the holes on the side, and insert the mounting screws. If your drive has a faceplate (usually black plastic with an LED), make sure it fits flush with the case before tightening the screws. If your drive will activate the hard-disk light on the front of the A2000, attach the LED wire and leave the A2000's faceplate in place.

After installing the drive, connect it to the power supply by plugging one of the Amiga's large four-pin plastic connectors to the drive's connector.

Now, install the drive controller. Usually, you can house the card in any Amiga slot, but inserting it into the first slot makes connecting the cables easier. Be careful not to put your controller into the 86-pin CPU slot. Follow the controller's instructions to connect the drive cables. With all your new equipment in place, reassemble your system.

You are now ready to prepare your drive, mountlist, and startup-sequence for use. Again, the exact process is system specific. Some controllers come with software that automatically prepares, formats, and partitions the drive, alters the boot disk's mountlist and startup-sequence, and copies any necessary files. Others may come with printed instructions only. For example, the software accompanying Commodore's A2090A board prepares and formats the disk; you follow the instructions and answer the prompts.

If you wish, under version 1.3 of the operating system, you can install a hard-disk partition that employs the FastFileSystem (FFS)—a new, faster, and more efficient method of using a hard drive on the Amiga. Unlike the older AmigaDOS file system (which was not designed for use on a hard drive), FFS stores only data in the disk's data blocks. Because FFS stores data on consecutive blocks when possible, it is able to read and write data significantly faster (about 300%) than the old file system. The method also lets you store about 50K more data per megabyte, giving you about 5% more usable storage space. FFS is so fast that the limiting factor in the data transfer rate ►

between the Amiga and hard disks now is dependent upon your specific drive and controller, and not on the file system. For the best performance, get a fast hard disk with a DMA controller.

Because FFS cannot be used on the first hard-drive partition (the first partition must be standard AmigaDOS), the setup procedure for an FFS partition is more involved than standard hard-drive software installation. First, you must install the device driver (supplied with your controller) in the Expansion drawer on your boot disk. For the A2090A controller, the files are called HDDISK and HDDISK.INFO. If the controller's installation software does not copy the driver to the Expansion drawer, use the Workbench or CLI to do so. Next, you must prepare the hard drive. For the A2090A, use PREP, the supplied utility program. When running programs such as PREP on a drive intended for use with FFS, keep the normal AmigaDOS partition small. When PREP prompts you for the HIGHCYL of the first partition, you should enter the number of the cylinder you want to be the last one in the small AmigaDOS partition, not the last cylinder on the disk. In the example mountlist below, the FFS partition starts at cylinder 29; therefore, when I used PREP on my drive I set the HIGHCYL of the AmigaDOS partition to 28. After preparing the AmigaDOS partition, reboot your Amiga.

The next step is to add an entry for an FFS partition into your mountlist file (located in the DEVS: directory of the boot disk) using ED or some other text editor. The FFS mountlist entry below is for a 40MB drive. Cylinders 0 and 1 are reserved for system use. I used PREP to create the first partition, called DH0: in cylinders 2 through 28, about one megabyte. The remaining 39 megs will be used for FFS.

```
FS1:  Device=hddisk.device
      FileSystem=l:FastFileSystem
      Unit=1
      Flags=0
      Surfaces=4
      BlocksPerTrack=17
      Reserved=2
      Interleave=0
      LowCyl=29 ; HighCyl=1223
      Buffers=40
      GlobVec=1
      BufMemType=1
      Stacksize=4000
      DosType=0x444F5301
#
```

To make sure that the hard-disk device driver is recognized by your system, open a Shell or CLI and type:

```
BindDrivers
```

►

Product Information

BACK-UP SYSTEMS

CLImate
Progressive Peripherals & Software
464 Kalamath St.
Denver, CO 80204
303/825-4144
$39.95

DiskMaster
Progressive Peripherals & Software
see address above
$49.95

QuarterBack
Central Coast Software
268 Bowie Dr.
Los Osos, CA 93402
805/528-4906
$69.95

Tape Back-Up Sub-System
C-Ltd
723 E. Skinner
Wichita, KS 67211
316/267-9100
$809.95

CONTROLLERS

A2090A
Commodore Business Machines
1200 Wilson Dr.
West Chester, PA 19380
215/431-4200
$399.95

A2000 Impact
Great Valley Products Inc.
225 Plank Ave.
Paoli, PA 19301
215/889-9411
$360, unpopulated

A2000 SupraDrive
Supra Corporation
1133 Commercial Way
Albany, OR 97321
503/967-9075
$299.95

A2000 Overdrive
Pacific Peripherals
46728 Fremont Blvd.
Fremont, CA 94539
$249

TURNKEY SYSTEMS

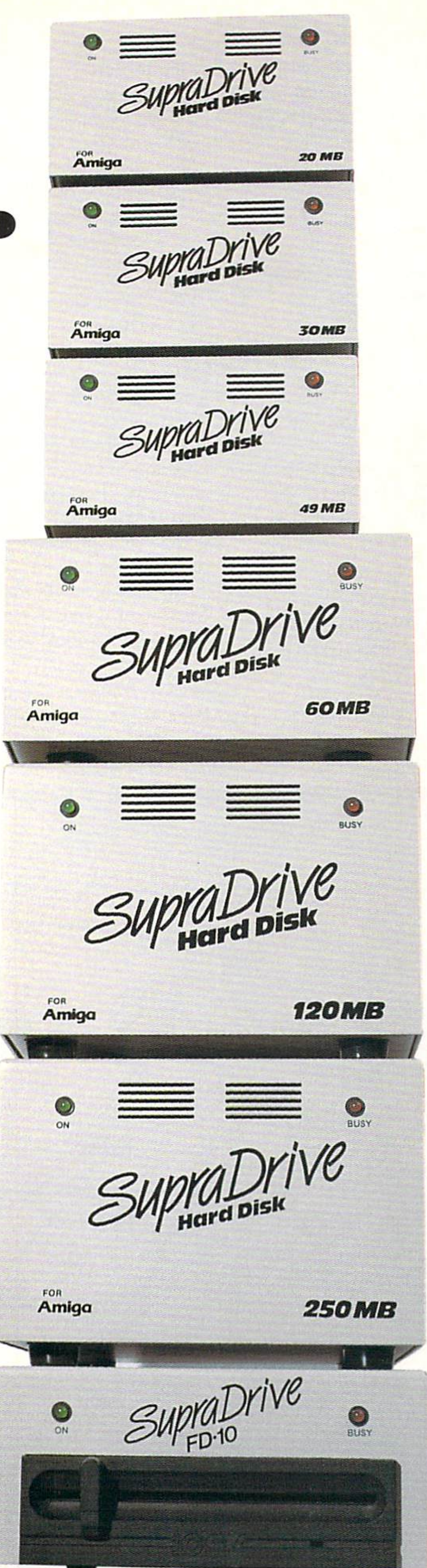
A2000 Hard Drive Systems
C-Ltd
see address above
$729.95 for 20MB system
up to $14,059.95 for 320MB system

Supra 4×4
Supra Corporation
see address above
$799 for 20MB system
$949 for 30MB system
$1195 for 60MB system

(For a complete list of Amiga hard drives and controllers, see our Hardware Buyer's Guide on page 32.)

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1133 Commercial Way, Albany, OR 97321
Telex: 5106005236 (Supra Corp.)
FAX: 503-926-9370

Circle 208 on Reader Service card.

Now, you must format the drive. Because PREP automatically mounts the first partition, you do not have to mount DH0:. To format the first (AmigaDOS) partition, simply type:

```
FORMAT DRIVE DH0: NAME "SLOWHD"
```

The first partition, cylinders 2 through 28, will be formatted under AmigaDOS.

Before formatting the FFS portion, you must mount it. To mount the FFS partition, type:

```
MOUNT FS1:
```

Next, you format the FFS partition by typing:

```
FORMAT DRIVE FS1: NAME "FASTHD" FFS
```

When the formatting process is complete, you should copy all the files on your Workbench 1.3 disk to the FFS partition, using the command:

```
COPY DF0: FS1: ALL
```

Now, edit your startup-sequence (in the boot disk's S directory) so it will mount the drive when you boot. For example, I added the following lines to the beginning of my startup-sequence:

```
system/fastmemfirst
BindDrivers
mount FS1:
FS1:c/assign c: FS1:c
FS1:c/assign sys: FS1:
FS1:c/assign l: FS1:l
FS1:c/assign fonts: FS1:fonts
FS1:c/assign devs: FS1:devs
FS1:c/assign libs: FS1:libs
FS1:c/assign s: FS1:s
FS1:c/assign system: FS1:system
```

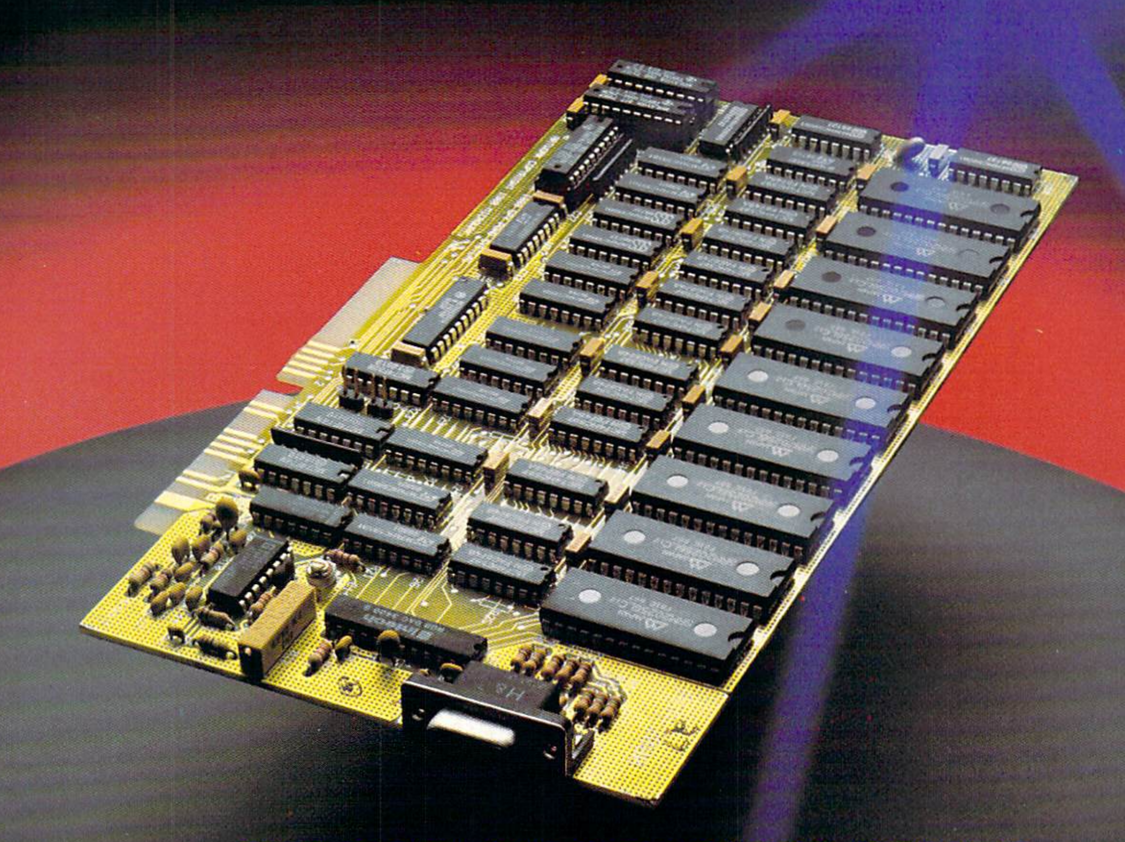
The first command runs the FASTMEMFIRST utility, which forces the Amiga to use fast memory if it is present. BindDrivers looks in the boot disk's Expansion drawer to find the hard-disk driver, then loads the driver into memory. Next, using the 1.3 MOUNT command, it mounts the FFS partition. The system now will recognize the existence of the FFS partition so you can use it. Because I have a copy of all my Workbench files and directories on FS1:, I then assign all of them to it so it becomes my default drive. Now all access of my System files will come from the hard disk.

When you reboot you will be using the new FastFileSystem as your default drive. (See "Care and Feeding" (p.26) for hard-drive handling hints.) ■

Louis R. Wallace is a contributing editor to AmigaWorld. *Write to him c/o* AmigaWorld *Editorial Dept., 80 Elm St., Peterborough, NH 03458.*

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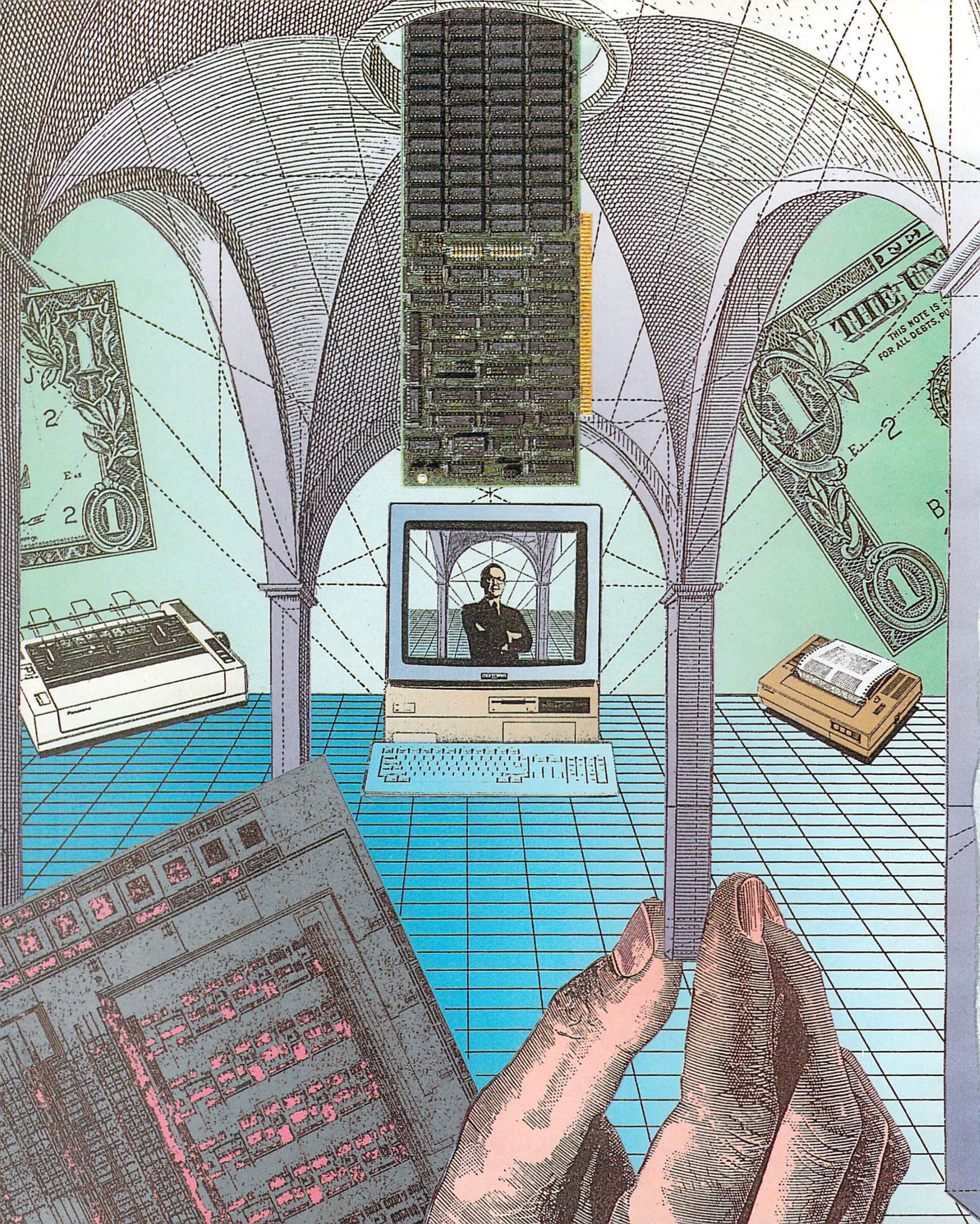
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The *AmigaWorld* Hardware Buyer's Guide

DO YOU SUFFER from Just-One-More-Device Syndrome? The symptoms are easy to spot. Does your car's dashboard look like a 747's? Is your stereo system slowly taking over the entire living room? Have the electrical outlets in your kitchen been condemned for overcrowding? Most importantly, is the combined worth of your computer, peripherals, and expansion devices threatening to surpass the value of your house?

Well, maybe you don't mind, and believe that "More is better." Or, perhaps like the sailor, you subscribe to "A device in every port," or, like the politician, "A chicken in every slot." In any event, we've compiled our annual smorgasbord of delectable chips and wire—The *AmigaWorld* Hardware Buyer's Guide—to satisfy your cravings. As always, the selection is extensive and varied. We have disk drives and controllers, memory-expansion boards, graphics, video, and music devices, networking equipment, and a whole lot more.

A few translations to make your selections easier: The Bus refers to the side expansion bus on the A500 and A1000, and Slot to an internal slot on the A2000 or a slot in an expansion chassis off the bus. Motherboard refers to the Amiga's main internal board; Mouse, Serial, Parallel, and RGB to the rear ports of the same name. External drive denotes disk-drive port, and Internal drive, the disk-drive cavity on the A2000. Internal refers to the expansion bus on the A500's underside. The letters (PT) in the Port column indicate pass-through, meaning you can attach other products to the peripheral.

We have listed only items that are or will be available by March 1, 1989. If the manufacturer has decided on a release date but not on a price, we listed TBA (To Be Announced) in the Price column. (Remember also, all prices are approximate. As the cost of chips and components fluctuate, so will the cost of hardware.)

Products are presented alphabetically within each category by name of product, followed by the name of the manufacturer. Consult the "Company List" at the end of the guide for further information about the manufacturer's address and telephone number. ►

Compiled by Jan Jackson and Bob Ryan

ILLUSTRATED BY MARC YANKUS

Clocks

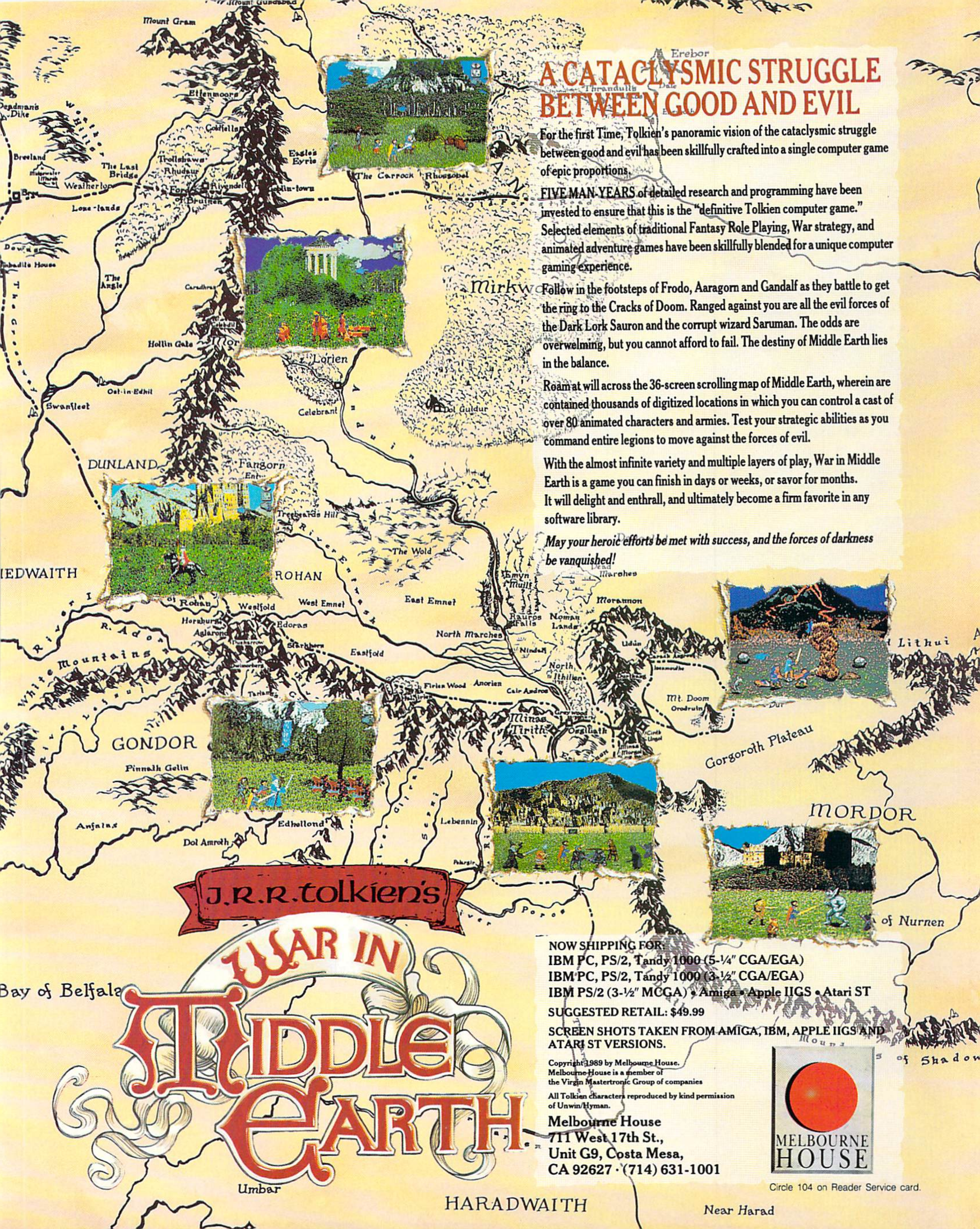
PRODUCT	COMPANY	PRICE	MACHINE	PORT	DESCRIPTION
A-Time	Akron Systems	$39.95	All	Parallel	Clock
MouseTime	MicroBotics	$39.95	1000	Mouse	Clock
TimeSaver/1000	C Ltd	$79.95	1000	Keyboard	Clock, 7K RAM for keyboard macros
TimeSaver/1000-2000 Adaptor	C Ltd	$39.95	2000	Keyboard	Enables A2000 to use TimeSaver/1000

Coprocessors

PRODUCT	COMPANY	PRICE	MACHINE	PORT	DESCRIPTION
68020 CPU Board	CSA	$995.00	2000	CPU slot	68020 Board; opt: 16-33 MHz 68882, 16MHz 68030
A2088 BridgeBoard	Commodore	$699.95	2000	Slot	IBM PC/XT clone-on-a-card, 5¼″ drive
HA030	Ronin	$320.00	1000, 2000	Hurricane	68030 adapter for Hurricane Board
Hurricane 68020-12	Ronin	$200.00	1000, 2000	Hurricane	12 MHz 68020 chip
Hurricane 68030 Processor	Ronin	$570.00	1000, 2000	Hurricane	16 or 20 MHz 68030 chip
Hurricane H1000 Accelerator	Ronin	$400.00	1000	Slot	Unpopulated 68020/68881 board
Hurricane H2000 Accelerator	Ronin	$600.00	2000	CPU slot	Unpopulated 68020/68881 board
Hurricane Math Coprocessors	Ronin	$200.00	1000, 2000	Hurricane	16MHz 68881; 20MHz 68881, 25MHz 68882 available
Multifunction Module	MicroBotics	$99.95	All	StarBoard2	68881 socket, clock, sticky disk, RAM parity checking
Piggyback	CSA	$895.00	500, 1000	Motherboard	68020 Board; upgradable with 16 MHz 68882
Processor Accelerator	Creative Micro.	$199.95	All	Motherboard	Replaces standard 68000 with 14.32 MHz 68000

Drives/Controllers

PRODUCT	COMPANY	PRICE	MACHINE	PORT	DESCRIPTION
10MB 5.25 Removable Floppy	C Ltd	$1089.95	2000	Slot	10MB 5¼″ removable media drive and controller
10MB Floppy System	C Ltd	$1329.95	1000	Bus	Removable media drive and controller
10MB Floppy System	C Ltd	$1329.95	500	Bus	10MB 5¼″ removable media drive and controller
20MB Floppy System	C Ltd	$2199.95	1000	Bus	2-20MB 5¼″ removable media drives and controller
20MB Floppy System	C Ltd	$2199.95	500	Bus	2-10MB removable media drives and controller
20MB Floppy System	C Ltd	$1959.95	All	SCSI	2-20MB removable media drives, no controller
20MB SCSI Drive & Controller	Comp-U-Save	$589.00	500, 1000	Bus (PT)	20MB SCSI hard drive and controller
3½″ Disk Drive	Comp-U-Save	$145.00	All	External drive	Single floppy drive with power supply
A-1000 Hard Drive Systems	C Ltd	$999.95	1000	Bus	24MB drive and SCSI controller, up to 320MB
A-1000 SCSI/1000	C Ltd	$299.95	1000	Bus	SCSI host controller
A-1000 Tape Back-Up System	C Ltd	$1049.95	1000	Bus	20MB tape back-up with controller
A-2000 Hard Drive Systems	C Ltd	$729.95	2000	Slot	20MB drive, SCSI controller, up to 320MB available
A-2000 SCSI/2000	C Ltd	$199.95	2000	Slot	SCSI host controller
A-2000 SCSI/2000R	C Ltd	$419.95	2000	Slot	SCSI/ST506 (RLL) controller
A-2000 SCSI/2506M	C Ltd	$379.95	2000	Slot	SCSI/ST506 MFM controller
A-2000 Tape Back-Up System	C Ltd	$799.95	2000	Slot	20MB internal tape back-up and controller
A-500 Hard Drive System	C Ltd	$999.95	500	Bus	24MB drive and SCSI controller, up to 320MB
A-500 SCSI/500	C Ltd	$249.95	500	Bus	SCSI controller
A-500 Tape Back-Up System	C Ltd	$1049.95	500	Bus	20MB tape back-up and controller
A2090A HD/SCSI Controller	Commodore	$399.95	2000	Slot	Autobooting ST506, SCSI DMA controller
A500 Hard Drive Controller	Pacific Periph.	TBA	500	Bus	SCSI controller, can hold up to 2MB RAM
Auto Card	Expansion Tech.	$179.95	500, 1000	Bus	Converts non-autoboot controller to autoboot
Autobootable Overdrive	Pacific Periph.	$249.00	2000	Slot	DMA/SCSI overdrive controller
BN20	Comspec	TBA	All	SCSI	Bernoulli 20MB drive for use with Comspec SCSI card
CA-880	California Access	$229.95	All	NA	External floppy disk drive
Dual 3½″ Disk Drive	Comp-U-Save	$299.00	All	External drive	Without power supply
Dual 3½″ Disk Drive	Comp-U-Save	$395.00	All	External drive	Dual floppy drive, power supply and 6′ cord
Dual Floppy Drive	Datel	$299.99	All	External	3½-inch floppy drives
Escort 1	Expansion Tech.	$179.95	All	External	Floppy drive
Escort Hard Drive Card	Expansion Tech.	$199.95	500, 1000	Bus	SCSI interface card
Escort Hard Drive Systems	Expansion Tech.	$335.00	500, 1000	Bus	SCSI DMA controllers, autoboot ►


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Rohan
Dunland
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Gorgoroth Plateau
Mt. Doom
Minas Tirith
Lorien
Fangorn
White Mountains

DRIVES/CONTROLLERS (continued)

PRODUCT	COMPANY	PRICE	MACHINE	PORT	DESCRIPTION
FData 10	Jaytron	$149.95	All	External	Floppy disk drive
FData 20	Jaytron	$299.95	All	External	Dual floppy disk drive
Flash Card	Expansion Tech.	$749.95	2000	Slot	32MB hard card, 48MB: $939.95
Flash Card Controller	Expansion Tech.	$229.95	2000	Slot	SCSI interface, autoboot, DMA
Floppy Drives	Expansion Tech.	$179.95	All	External	3½-inch external drive
Hard Disk Drive	CSA	$895.00	2000	Slot	20MB drive, SCSI controller; 40MB available
Hard Drive & Controller	Comspec	TBA	1000	Bus (PT)	20MB autobooting SCSI drive; 40MB available
HardFrame/2000	MicroBotics	$329.00	2000	Slot	DMA SCSI hard-disk interface, autobooting
HDA-506 Hard Drive Adaptor	Spirit	$294.00	500, 1000	Bus	Adapts ST506 controllers for use with Amiga
HDA-506-2 Hard Drive System	Spirit	$799.00	500, 1000	Bus	20 MB MFM ST506 hard-drive system, autoboot
HDA-506-4 Hard Drive System	Spirit	$999.00	500, 1000	Bus	40MB MFM ST506 HD, optional autoboot ROM
Impact A2000-1/0	GVP	$325.00	2000	Slot	SCSI DMA controller, sockets for 1MB RAM, autoboot
Impact A2000-2/0	GVP	$360.00	2000	Slot	SCSI DMA Controller, autoboot, room for 2MB
Impact A500-2/0 RAM EPROM	GVP	$100.00	500	Impact 500	Add 2MB RAM and autoboot to Impact 500 system
Impact A500-20HD/RAM	GVP	$795.00	500	Bus	20MB SCSI system, room for 2MB RAM, 30MB, 45MB
Impact A500-40Q/RAM	GVP	$1650.00	500	Bus	40MB fast access hard-drive system, room for 2MB RAM
Impact A2000-HC/20	GVP	$675.00	2000	Slot	20MB SCSI system, autoboot, DMA; up to 100MB avail.
Impact A2000-HC/40Q	GVP	$999.00	2000	Slot	40MB fast-access SCSI system, autoboot, DMA
Master 3-A Disk Drive	Oceanic America	$159.00	All	External drive	Floppy disk drive
PAB-500, PAB-1000	Phoenix	$179.95	500, 1000	Bus (PT)	Allows non-autoboot hard drives to autoboot
PFD-135	Phoenix	$179.95	All	External drive	External floppy drive
PFD-135I	Phoenix	$162.95	2000	Internal drive	Internal floppy drive
PFD-235A	Phoenix	$324.95	All	External drive	Dual floppy drive
PHD-22/500 or /1000	Phoenix	$679.95	500, 1000	Bus	22MB SCSI hard-drive system, 32MB and 48MB avail.
S-1020 Hard Drive System	Xetec	$849.00	1000	Bus	20MB SCSI hard-drive system
S-1040 Hard Drive System	Xetec	$1049.00	1000	Bus	40MB SCSI hard-drive system
S-520 Hard Drive System	Xetec	$799.00	500	Bus	20MB SCSI drive and controller
S-540 Hard Drive System	Xetec	$999.00	500	Bus	40MB SCSI drive and controller
SA 2000	Comspec	TBA	2000	Slot	SCSI interface for Iomega Bernoulli Box
SA 500, SA 1000	Comspec	TBA	500, 1000	Bus	SCSI interface for the Iomega Bernoulli Box
SA-20	Xetec	$199.00	2000	Slot	SCSI hard-disk interface card
SA-2020	Xetec	$649.00	2000	Slot	20MB SCSI drive and controller card
SA-2040	Xetec	$849.00	2000	Slot	40MB drive with SCSI controller
SA-5 Host Adaptor	Xetec	$250.00	500, 1000	Bus	SCSI interface
SCSI Interface	CSA	$595.00	2000	Slot	Interface for hard disks and devices
SCSI Module	ASDG	$199.00	2000	Twin X	SCSI interface controller
SCSI to ST506 Omti 3520	C Ltd	$229.95	All	SCSI	Add ST506 compatibility to C Ltd SCSI controller
SCSI to ST506 Adeptec 4070	C Ltd	$199.95	All	SCSI	Use ST506 drives with C Ltd SCSI controller
SCSI to ST506 Omti 3527	C Ltd	$269.95	All	SCSI	Add ST506 compatibility to C Ltd SCSI controller
SCSI to ST506 Adeptec 4000	C Ltd	$189.95	All	SCSI	Use ST506 drives with C Ltd SCSI controller
ST-40 Tape Sub-System	Xetec	$650.00	500, 1000	SCSI	40MB streaming tape back-up system
Single Floppy Drive	Datel	$169.99	All	External	3½-inch floppy
StarDrive SCSI Module	MicroBotics	$129.95	All	StarBoard2	High-speed SCSI interface, clock
SupraDrive 4×4	Supra	$995.00	500, 1000	Bus (PT)	20MB SCSI drive; up to 2MB RAM; drive to 250MB
SupraDrive 4×4	Supra	$799.00	2000	Slot	20MB SCSI system; 30MB and 60MB avail.
SupraDrive FD-10 Removable	Supra	$995.00	2000	Slot	10MB 5¼" SCSI floppy drive system
SupraDrive FD-10 Removable	Supra	$995.00	500, 1000	Bus (PT)	10MB 5¼" SCSI floppy drive; $895 w/o interface
T-60	Xetec	$450.00	2000	SCSI	60MB streaming tape back-up with software, cables
Tape Back-Up Sub-System	C Ltd	$809.95	All	SCSI	20MB external tape back-up, no controller
Trump Card	Interactive Video	$189.95	2000	Slot	SCSI hard disk contoller, A500-$249.95
Twindrive	M.A.S.T.	$299.00	All	External drive	Dual external floppy drive
Unidrive	M.A.S.T.	$169.00	All	External drive	External floppy drive
WEDGE	RSI	$185.00	500, 1000	Bus	Adapts IBM ST506 controllers to Amiga
WEDGE Hard Drive System	RSI	$760.00	500, 1000	Bus	Wedge with IBM ST506 controller and drive ►

Expansion

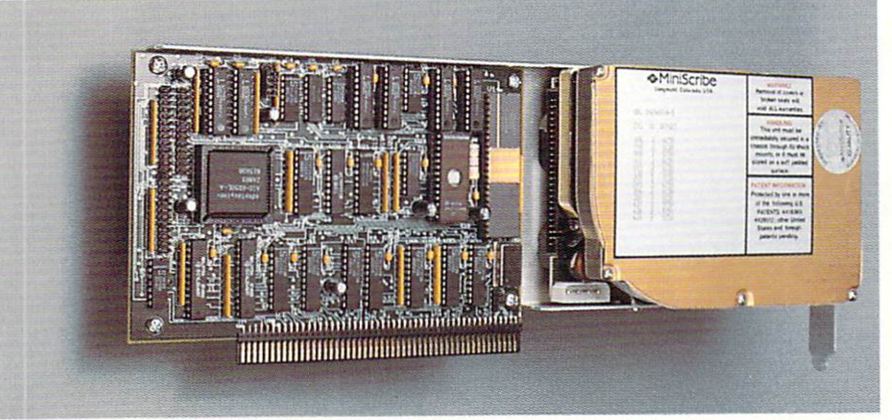
PRODUCT	COMPANY	PRICE	MACHINE	PORT	DESCRIPTION
Bus Expander	Bill's Boards	$495.00	500, 1000	Bus	Provides 6 A2000 slots and 6 IBM slots
Mini-rack C	ASDG	$195.00	1000	Bus	2-slot Zorro 1 subset, +5 volt power supply
Mini-rack D	ASDG	$325.00	1000	Bus	2-slot Zorro 1 chassis; +5, −5, +12, −12 volts
PEC-2510, PEC-2110	Phoenix	$179.95	500, 1000	Bus	Expansion chassis for A2000 cards, $254 w/power supply
Subsystem 1000	Pacific Periph.	$299.00	1000	Bus (PT)	Three A2000 slots
Subsystem 500	Pacific Periph.	$249.00	500	Bus (PT)	2-A2000 slots, power supply; $399 with floppy drive
Tool Box	Expansion Tech.	$189.95	500, 1000	Bus	2-A2000 slots, 1 amp power supply; 3 amp: $259.95

Graphics/Video

PRODUCT	COMPANY	PRICE	MACHINE	PORT	DESCRIPTION
4003RCU	Amicore Int'l	$499.00	2000	Slot	Remote control for Magni Genlock
520 Video/RF Modulator	Commodore	$49.00	500	RGB/RCA	NTSC composite video encoder and RF modulator
A-Video	Akron Systems	$49.95	500, 2000	RGB	Use Amiga with color composite monitor
A1300 Genlock	Commodore	$299.95	1000	RGB (PT)	Synchronizes Amiga graphics with video signal
A2300 Genlock	Commodore	$399.00	2000	Video slot	Overlay Amiga graphics on PAL or NTSC video
Amiga Light Pen Driver	Inkwell	$129.95	All	Mouse	Light pen and driver
AmiGen	Mimetics	$199.95	All	RGB (PT)	NTSC genlock
AmiLink	RGB Video	$1995.00	All	Serial (PT)	Interactive video editing controller
AProDraw	R & DL Prod.	$549.00	All	Serial	Drawpad with stylus, 12×12 inches (9×6: $449)
C-View/1 Composite NTSC	C Ltd	$39.95	500, 2000	RGB	Hook Amiga to composite monitor
C-View/1 Composite PAL	C Ltd	$39.95	500, 2000	RGB	Use Amiga with PAL monitors
C-View/2 Chroma/Luma NTSC	C Ltd	$39.95	500, 2000	RGB	Use Chroma/Luna monitor with Amiga
C-View/2 Chroma/Luma PAL	C Ltd	$39.95	500, 2000	RGB	Use Chroma/Luma PAL monitors with Amiga
Color Splitter	SunRize	$99.95	All	Digitizer	Replaces color wheel for digitizers
Digi-Droid	NewTek	$79.95	All	Digi-View	Automated filter wheel for Digi-View
Digi-View Gold	NewTek	TBA	500, 2000	Parallel	Video digitizer with powered gender changer
EASYL	Anakin	$499.00	2000	Slot	Pressure sensitive drawpad; A1000: $499; A500: $399
flickerFixer	MicroWay	$595.00	2000	Video slot	Eliminates hi-res flicker
Frame Buffer	Mimetics	$549.95	2000	Slot	Stores and displays a four-field NTSC overscanned image
Frame Grabber	Progressive Periph.	$699.95	All	Parallel	Real-time color video digitizer
Future Touch	Amigo Bus. Comp.	$3500.00	2000	NA	Touch-screen 2000 system with 20MB hard disk
GEN/ONE	Comm. Spec.	$895.00	All	RGB	Genlocking encoder, RS-170A, VHS compat. Y/C outputs
Genlock Encoder System 1	Magni Systems	$1695.00	2000	IBM, Video	Genlock w/fading, keying; w/control box: $1,995
Image Master Pro-Genlock	Neriki	$2195.00	All	RGB	Encodes and syncs RGB output to composite video signal
Imprint 3.0	Liquid Light	$2495.00	All	Serial	Polaroid Palette image recorder and software
IS Penmouse	Kurta	$295.00	All	Serial	Drawpad with remote stylus
LIVE!	A-Squared	$399.00	500	Bus	Real-time video digitizer
LIVE!	A-Squared	$295.00	1000	Bus	Real-time video digitizer
LIVE!	A-Squared	$450.00	2000	Slot	Real-time video digitizer w/ADO effects, BNC connectors
Mediaphile 1.3 System	Interactive Micro.	$275.00	All	Mouse	Audio/Video editing, hardware/software package
Mediaphile 8MM Video Prod.	Interactive Micro.	$5948.00	NA	NA	Sony 8mm Video deck, camera, and controller
Mediaphile SVHS Video Prod.	Interactive Micro.	$7161.00	NA	NA	Includes JVC video deck and camera, SVHS & Amiga
Mediaphile System I-B	Interactive Micro.	$903.00	All	Mouse	Modified Sony EV-A80 8mm VTR plus Mediaphile 1.2
Mediaphile System II	Interactive Micro.	$2828.00	All	Mouse	Modified Sony 8mm video deck, camcorder, controller
Mediaphile VHS	Interactive Micro.	$5592.00	NA	NA	JVC VHS video deck and Amiga computer system
Perfect Vision	SunRize	$249.95	All	Parallel	Real-time black-and-white video digitizer
ProGEN	Progressive Periph.	$449.95	All	RGB (PT)	Genlock with software, broadcast quality RS 170A
Pro. ScanLab	ASDG	$995.00	2000	Slot	Interface for Sharp JX-300 and JX-450 color scanners
ScanLab/100	ASDG	TBA	All	Parallel	Interface for Sharp JX-100
Scanner Interface Package	Gold Disk	$1195.00	All	Parallel	Canon IX12 300 DPI scanner with interface
Super Gen	Digital Creations	$749.95	All	RGB (PT)	Genlock, broadcast quality, allows fade in and out
V-I 2000	Creative Micro.	$79.95	2000	Video slot	Connects Commodore 1702 monitor; $99.95 with RF
V-I 500	Creative Micro.	$79.95	500	RGB	Connects Commodore 1702 monitor; $99.95 with RF
VD I	Impulse	$1000.00	All	Parallel	Real time video digitizer and 24-bit frame buffer ►

HardFrame/2000

The *Super-Speed*, DMA, SCSI Hard Disk Interface for the Amiga® 2000



- **AutoBoots AmigaDOS 1.3 *(Price Includes HardFrame Eprom!)***
- ***Directly* Boots the New Fast-File System! *(Doesn't Need Old FS!)***
- **Auto-mounts All Hard Disk Partitions *(no Mount List Required!)***
- **Designed-in, Ultra Strong, Multitasking Performance**
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- **50-pin Cable Included**
- **Supports up to *seven* SCSI hard disks of any size**

How fast is *fast*? **HardFrame/2000** transfers data at Amiga bus speeds! It's actually faster than the hard disk mechanism itself! And even more important in the Amiga's multitasking environment, **HardFrame/2000** has extremely efficient DMA circuitry to get on and off the bus in almost no time at all: 280ns to get on; 200ns to get off. And it's true, dedicated DMA, too! **HardFrame/2000** autoboots *and* automounts *directly* into the AmigaDOS™ 1.3 Fast File System (old file system partitions are *not* needed!). The core of any DMA SCSI interface is in its SCSI protocol chip and DMA chip. MicroBotics has chosen the new, high performance Adaptec AIC-6250 SCSI chip, capable of up to 5 megabytes per second raw transfer speed, and the Signetics 68430 DMA chip running at 12.5 megahertz. Then we added additional FIFO buffering and enabled 16-bit wide data transfers for maximum throughput. The sophisticated design of **HardFrame/2000** provides for automatic SCSI arbitration, selection and reselection. The hardware supports either synchronous or asynchronous data transfer. **HardFrame/2000** can function as either the SCSI bus initiator or the target and can reside in a multiple master environment. Physically, **HardFrame/2000** is optimally flexible: the compact, half-size card comes attached to a full length, plated aluminum frame. The frame has mounting holes positioned to accept standard, 3.5" SCSI hard disk units such as those manufactured by MiniScribe, Seagate, Rodime, and others (hard disk mechanisms must be supplied by the user or his dealer as a separate purchase item). Alternatively, you can cable-connect to a SCSI drive mounted in your Amiga's disk bay or in an external chassis. As many as seven hard disks may be connected to a single **HardFrame/2000**. There is no size limit on each disk. **HardFrame/2000** includes a 50-pin SCSI cable and header connectors for either 50-pin or 25-pin cable connection. Also included is a current tap to power frame-mounted drives directly from the slot itself. **HardFrame/2000** comes complete with driver, installation, and diagnostic software.

Available NOW! Suggested list price, $329 (hard disk not included)
Frameless version: $299.00. See your Amiga Dealer.

The HardFrame/2000 photo shows the product with a MiniScribe twenty megabyte hard disk installed. Hard disks are *not* included in the purchase price of HardFrame. Note that if placed in the first slot, HardFrame uses only one slot even with a disk attached.

New!

8-UP! (DIP) FastRAM

Another great memory board from MicroBotics, 8-UP! (DIP) is the "brother" of the original 8-UP! (which uses SIMMs and PopSIMMs to fill its memory space). 8-UP! (DIP) uses conventional 1 megabit RAM chips in standard sockets to provide your Amiga 2000 with 2, 4, 6, or 8 megabytes of autoconfiguring FastRAM! 8-UP! (DIP) is a super efficient CMOS design for lowpower consumption and high reliability. Suggested list price, $199 (0k installed)

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GRAPHICS/VIDEO (continued)

PRODUCT	COMPANY	PRICE	MACHINE	PORT	DESCRIPTION
Video Bus/Slot Expansion	Amicore Int'l	TBA	2000	Video slot	Use Magni Genlock and flickerFixer in same system
Video Toaster	NewTek	$1299.00	2000	Video slot	Digital video effects, frame capture, genlock
X-Specs 3D	Haitex	$124.95	All	Mouse	Three dimensional viewing glasses

INTERFACING/NETWORKING

PRODUCT	COMPANY	PRICE	MACHINE	PORT	DESCRIPTION
A2000 Auto-Config Proto Card	Interactive Video	$59.95	2000	Slot	Prototyping card without auto-config logic
A2000 Auto-Config Proto Card	Interactive Video	$139.95	2000	Slot	Prototyping card with auto-config logic
Ameristar Internet Package	Ameristar	$899.00	2000	Slot	Ethernet board with Network File System software
Amiga GPIB	ACDA	$395.00	2000	Slot	IEEE-488 interface to 14 devices, software included
Dual Serial Module	ASDG	$199.00	2000	Twin X	Provides 2 serial ports
GPIB Module	ASDG	$199.00	2000	Twin X	Gives Twin X GPIB capability
MCS 1000	Comspec	TBA	All	Parallel	Adapts IEEE printers to Centronics interface
MCS 6550	Comspec	TBA	All	Parallel	256K Centronics print buffer; works with MCS 8000
MCS 8000	Comspec	TBA	All	Parallel	4-channel printer network; 8-channel also available
Proto 40K	ACDA	$1895.00	2000	Slot	16-channel 12-bit A/D; 2-channel 8-bit D/A
Proto 5K	ACDA	$279.00	All	Parallel (PT)	1-channel A/D converter; amplifier, VU meter
Protoboard II	Akron Systems	$49.95	2000	Slot	Prototyping board
Twin X	ASDG	$329.00	2000	Slot	IEEE 959 interface board
Zorro II Prototyping Board	Celestial Systems	$49.95	2000	Slot	Unpopulated Zorro 2 board

MEMORY

PRODUCT	COMPANY	PRICE	MACHINE	PORT	DESCRIPTION
.5MB Clock/Calendar	Datel	$69.99	500	Internal	512K RAM, 0 RAM installed, w/clock
.5MB Clock/Calendar	Skyles	$79.95	500	Internal	Unpopulated A501 replacement; w/512K RAM: $179.95
1.5MB Internal Memory	Skyles	$249.95	500, 1000	Motherboard	Unpopulated; .5MB: $379.95; 1MB: $499.95
.5MB RAM	Datel	$39.99	500	Internal	512K RAM, 0 RAM installed
.5MB RAM	Supra	$149.95	500	Internal	Replacement for A501, 512K RAM, clock
1MB Internal Memory	Skyles	$349.95	500	Motherboard	1MB RAM
2 MEG Memory Board	ASDG	$399.00	1000	Slot	Unpopulated 2MB memory board, Zorro 1
256 Board	Skyles	$169.95	1000	Front panel	256K chip RAM upgrade
2MB Internal Memory	Skyles	$124.95	2000	Slot	Unpopulated 2MB RAM board; 1MB, 2MB avail.
8 MEG Memory Board	ASDG	$499.00	1000	Slot	Unpopulated 8MB expansion board, Zorro 1
8-UP!	MicroBotics	$199.00	2000	Slot	Unpopulated 8MB RAM board, uses PopSimms or SIMN
8-UP! (DIP)	MicroBotics	$199.00	2000	Slot	Unpopulated 8MB RAM board, uses 1M-bit DRAMS
A2052 2MB RAM Expansion	Commodore	$549.95	2000	Slot	2MB RAM; available with 512K or 1MB
A2058 8MB RAM Expansion	Commodore	$799.00	2000	Slot	Available with 4MB or 8MB RAM
A501 Memory Extension	Commodore	$199.95	500	Internal	512K RAM with clock/calendar
Amega Board	C Ltd	$279.95	1000	Bus	Unpopulated 1MB memory board
Amega Pass Thru Board	C Ltd	$19.95	1000	Amega	Adds pass through to Amega board
AX2000	Comspec	TBA	1000	Bus (PT)	2MB RAM
DragStrip	CSA	$795.00	2000	Slot	Converts 16-bit RAM to 32 bits, contains 32-bit ROM
EXP-1000	Progressive Periph.	$299.95	500	Motherboard	Unpopulated 1MB RAM board, autoconfig; 1MB avail.
EXP-512	Progressive Periph.	$79.95	500	Internal	Unpopulated A501 replacement, with clock/calendar
FastPac	CSA	$1295.00	2000	Slot	32-bit static RAM board includes Kickstart
Hurricane M1000/M2000	Ronin	$600.00	1000, 2000	Hurricane	Unpopulated 32-bit memory boards, for Hurricane
IN-1000 0K Internal Memory	Spirit	$294.00	1000	Motherboard	Unpopulated RAM board, up to 2MB, autoconfig, clock
IN-500 0K Internal Memory	Spirit	$250.00	500	Motherboard	Unpopulated, up to 1.5MB, optional clock
Insider	Michigan Software	$150.00	1000	Motherboard	Unpopulated RAM boards; up to 1MB, clock
Megaboard 2000	Progressive Periph.	$599.95	2000	Slot	2MB RAM board
Memory Module	Supra	$799.00	500, 1000	SupraDrive	2MB memory board, fits inside SCSI interface board ►

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Memory (continued)

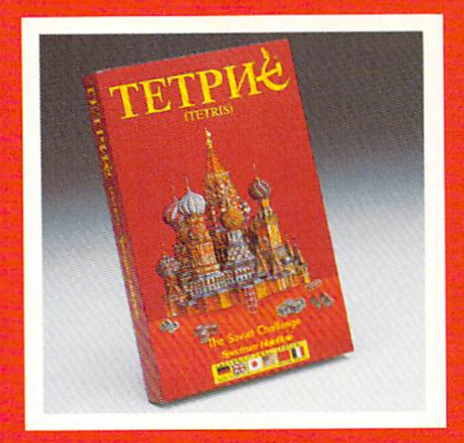
PRODUCT	COMPANY	PRICE	MACHINE	PORT	DESCRIPTION
Minimegs 500	M.A.S.T.	$199.00	500, 1000	Bus	Unpopulated RAM board; holds up to 2MB
PopSIMMs	MicroBotics	$89.95	2000	8-UP!	Unpopulated SIMM boards, 256K or 1MB capacities
ProRam 2000	Progressive Periph.	$299.95	2000	Slot	Unpopulated 8MB board, up to 2MB $879.95
RAM/Clock 0K	C Ltd	$69.95	500	Internal	Unpopulated A501 replacement card
RE 2000	Comspec	TBA	2000	Slot	Unpopulated 2MB RAM board
SIN-500-2	Spirit	$262.50	500	Motherboard	Unpopulated RAM board, up to 2MB, autoconfig
StarBoard2	MicroBotics	$339.00	500, 1000	Bus (PT)	512K RAM, upgradable to 1MB
StarBoard2/SB2000	MicroBotics	$339.00	2000	Slot	StarBoard2 adapted for A2000

Music/Sound

PRODUCT	COMPANY	PRICE	MACHINE	PORT	DESCRIPTION
Audio 2000	Day's	$79.95	2000	IBM slot	Internal stereo amplifier
FutureSound	Applied Visions	$179.00	1000	Parallel (PT)	Audio digitizer; line and mike input; w/mike
FutureSound	Applied Visions	$119.95	500, 2000	Parallel (PT)	Stereo audio digitizer; line and mike input
FutureSound Adapter	Applied Visions	$20.00	500, 2000	Parallel (PT)	Connects FutureSound with A500 or A2000
Harmony	Impulse	$200.00	All	Serial	Voice recognition
MIDI 1	Creative Micro.	$79.95	All	Serial	MIDI interface, 3 OUTs/THRUs, MIDI IN, SYNC OUT
MIDI For Amiga	Skyles	$49.95	All	Serial	MIDI-IN, two OUTs, one THRU
MIDI Gold Insider	Golden Hawk	$89.95	2000	Serial (PT)	MIDI-IN/THRU, 2 OUTs
MIDI Interface	Mimetics	$49.95	All	Serial	MIDI-IN, OUT
MIDI Interface	ECE	$64.95	All	Serial (PT)	MIDI-IN, OUT and THRU
MIDI-Gold 500	Golden Hawk	$79.00	500	Serial	MIDI-IN, two OUTs, and switchable OUT
MIDI-STAR MS-2X6	Spirit	$262.50	All	Serial	2 IN, 6 OUT/THRU/OFF and RS232, LED indicator
Midimaster	Datel	$59.99	All	Serial	MIDI IFC with MIDI IN/THRU, 3 OUTS
Perfect Sound	SunRize	$89.95	500, 1000	Parallel	Two-channel stereo digitizer
Pro Sampler Studio	Datel	$119.99	All	Serial	Sound sampler with software
Sound Sampler	Mimetics	$99.95	All	Mouse	Audio digitizer
ProSound Designer	Precision Inc.	$159.95	1000	Parallel	Sound digitizer, with gender bender for A500 & A1000

Miscellaneous

PRODUCT	COMPANY	PRICE	MACHINE	PORT	DESCRIPTION
2000 Extension Board	Bill's Boards	$75.00	2000	Slot	Extends A2000 slots
Access-64	Progressive Periph.	$79.95	All	Parallel (PT)	Use C-64/128 peripherals with Amiga
Adaptor board	Xetec	$16.00	500, 1000	SCSI	25-pin Sub-D to 50 pin SCSI
Alignment Kit	ECE	$175.00	All	NA	Aligns disk drives
CT-600H	Xetec	$25.00	500, 1000	ST-40	Additional digital cassette for ST-40 system
CPS-500	Phoenix	$99.95	500	Power	A500 power supply, 5V-DC, 8 Amps
CPS-500	Phoenix	$99.95	500	Power	A500 power supply, 5V-DC, 8 Amps
Data Acquisition Unit	Datel	$179.99	All	Parallel	Dual-channel storeage scope simulation
Kickstart Eliminator/RAM Kit	Creative Micro.	$129.95	1000	Motherboard	Puts Kickstart in ROM, adds 256K RAM
PAL Chips J & K for A1000	C Ltd	$39.95	1000	WCS	Replacement PALs for Writable Control Store
Robot Arm	Datel	$129.99	All	Parallel	5-axis movement robot arm
SB2000 Adaptor Card	MicroBotics	$49.95	2000	Slot	Adapts StarBoard2 1000 version to A2000
SB500 Powercase	MicroBotics	$169.00	500	Bus (PT)	Adapts StarBoard2 1000 version to A500
SCSIDOS 2.01 Upgrade	C Ltd	$19.95	All	SCSI	Upgrade SCSI controller to run SCSIdos 2.01
Secure Data Cartridge	CSA	$995.00	2000	NA	Security encasement for CSA hard disk drive
Serial Expander 2000	Golden Hawk	$19.95	2000	Serial	Allows use of A1000 serial devices
T1000	Amicore Int'l	$19.90	1000	Parallel	Lets A1000 use A500 and A2000 parallel port products
T2500	Amicore Int'l	$19.90	500, 2000	Parallel	Lets A500, A2000 use A1000 parallel peripherals
T2500 Plus	Amicore Int'l	$49.95	500, 2000	Parallel	Lets A500, A2000 use A1000 parallel devices
The Brick	Expansion Tech.	$119.95	500	Power	Replacement/upgrade power supply
Whomper Out	M.A.S.T.	$39.95	All	NA	Virus deterrent for external drive
Whomper Plus	M.A.S.T.	$69.95	All	NA	Internal hardware virus deterrent
Kwikstart Plus	Michigan Software	$169.95	1000	Motherboard	Puts 1.3 Kickstart in ROM, adds 256K RAM ►

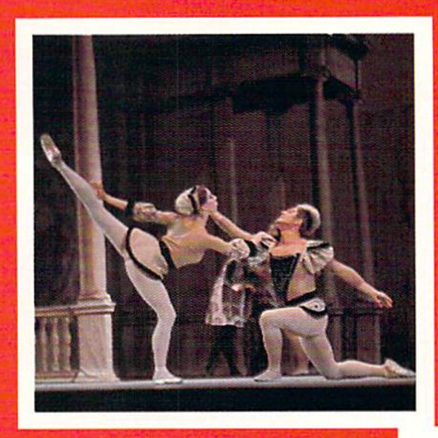


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TETRIS is available on most machine formats.

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Buyer's Guide Company List

ACDA
220 Belle Meade Ave.
Setauket, NY 11733
516/689-7722

Akron Systems Development
PO Box 6408
Beaumont, TX 77705
409/833-2686

Ameristar Technologies
47 Whittier Ave.
Medford, NY 11763
516/698-0834

Amicore International
154 Grove St.
Chicopee, MA 10120
413/592-9122

Anakin Research Inc.
100 Westmore Dr., 11C
Rexdale, Ontario
Canada M9V 5C3
416/744-4246

Applied Visions
Suite 2200
1 Kendall Square
Cambridge, MA 02139
617/494-5417

ASDG
925 Stewart St.
Madison, WI
608/273-6585

A-Squared Distributions
6114 La Salle Ave.
Suite 326
Oakland, CA 94611
415/339-0339

Bill's Boards
distributed by Comp-U-Save

Business Technology Services
202 Cirrus Rd.
Holbrook, NY 11741
516/472-9033

California Access
780 Montague Expressway
Suite 403
San Jose, CA 95131
408/435-1445

Celestial Systems
2178 Agate Court
Simi Valley, CA 93065-1839
805/582-0729

C Ltd
723 E. Skinner
Wichita, KS 67211
316/267-3807

Commodore Business Machines
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West Chester, PA 19380
215/431-9100

Communications Specialties
6090 Jericho Turnpike
Commack, NY 11725
516/499-0907

Compu_Art
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Victoria Station
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Canada H3Z 2V8
514/483-2080
514/737-5865

Comp-U-Save
414 Maple Ave.
Westbury, NY 11590
516/997-6707
800/356-9997
(outside New York)

Computer System Associates
7564 Trade St.
San Diego, CA 92121
619/566-3911

Comspec Communications
153 Bridgeland Ave.
Unit 5
Toronto, Ontario
Canada M6A 2Y6
416/785-3553

Creative Microsystems Inc.
10110 SW Nimbus
Suite B1
Portland, OR 97223
503/620-3821

Datel Computers
3430 E. Tropicana Ave.
Unit 67
Las Vegas, NV 89121
702/454-7700

Day's
17538 Glen Rd.
Gambier, OH 43022
614/397-5639

Designlab
PO Box 419
Owego, NY 13827

Digital Creations
2865 Sunrize Blvd.
Suite 103
Rancho Cordova, CA 95742
916/344-4825

ECE Research & Development
1651 N. Monroe St.
Tallahassee, FL 32303
904/681-0786

Expansion Technologies
46127 Landing Parkway
Fremont, CA 94538
415/656-2890

Gold Disk
2175 Dunwin Drive
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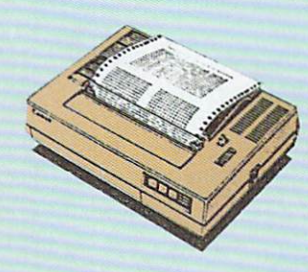
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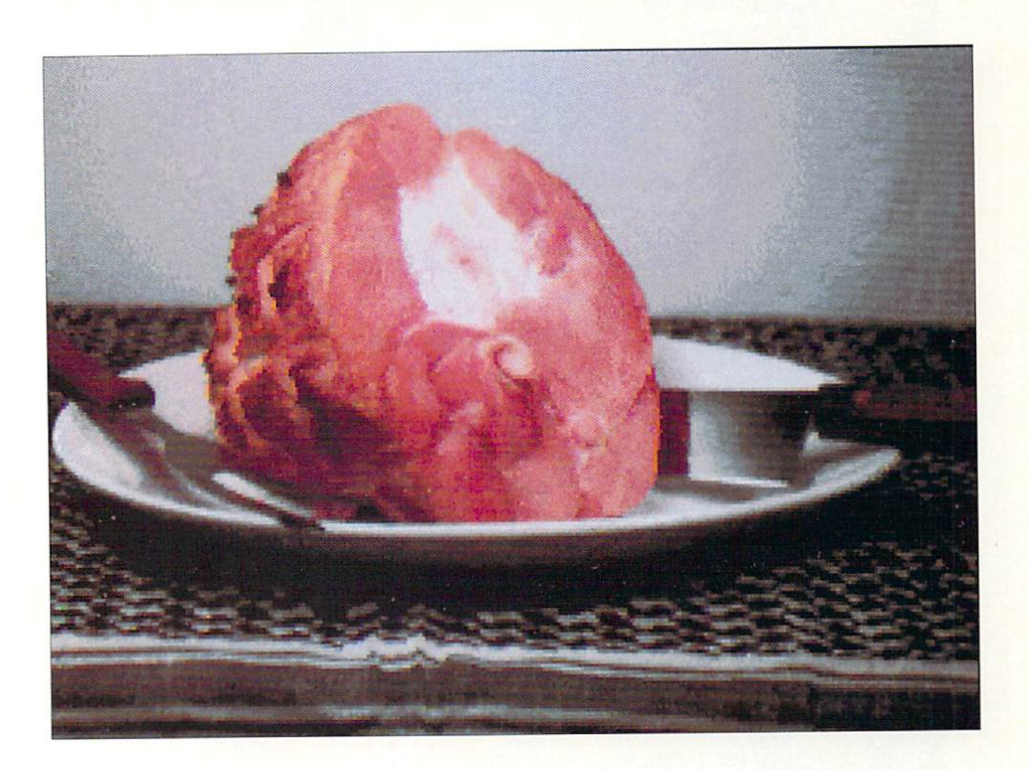
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HIGH ON THE HOG

Although current Amiga paint programs may be a long way from state-of-the-art when it comes to HAM display mode, three promising graphics packages have taken the crucial first steps in exploiting the full color capabilities of the Amiga.



3 HAM Paint Programs For the Amiga

AS REMARKABLE AS some paint programs are in tapping the awesome graphics capabilities of the Amiga, they still point up a frequent and frustrating phenomenon concerning the entire Amiga market: Software development has yet to take full advantage of the technological possibilities offered by Amiga hardware. If the Amiga is capable of displaying a full 4096 colors in excellent resolution, then what is the benefit of being able to work with only 16 or 32 colors (or even 64 in Halfbrite mode) under the limitations of current Amiga software?

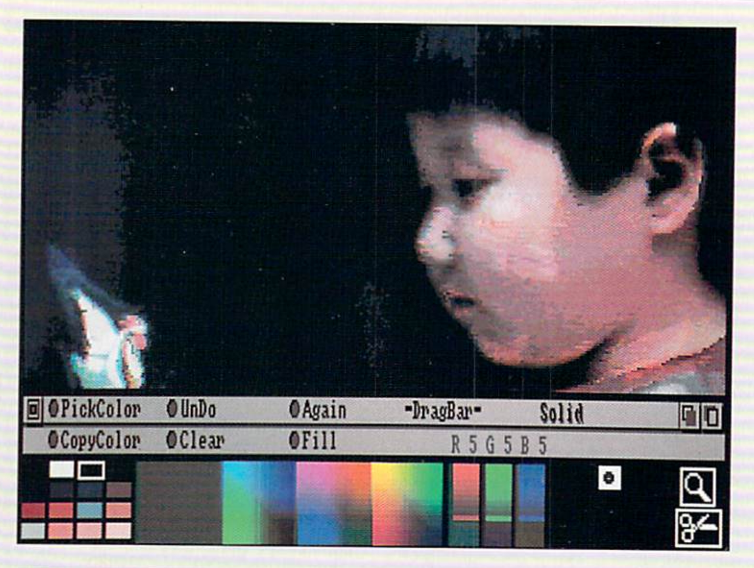
HAM (Hold-and-Modify) display mode offers a way out of that bind, and at least three paint packages—Digi-Paint (NewTek), Photon Paint (MicroIllusions), and Deluxe PhotoLab (Electronic Arts)—have endeavored to deliver on the promise of displaying and manipulating all 4096 Amiga colors simultaneously. (For an explanation of the HAM display mode, see "HAM: Color By The Numbers," p. 51.) Indeed, all three programs, to varying degrees, will render beautiful, detailed images in dazzling colors.

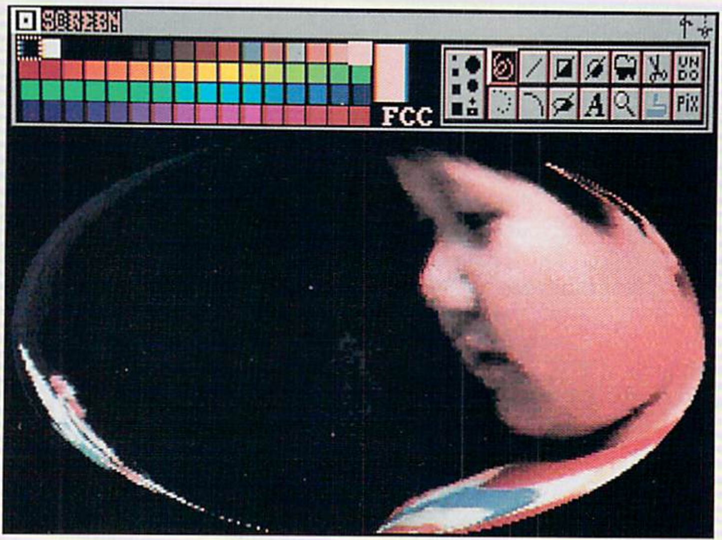
Before proclaiming the advent of a new Renaissance, however, be prepared to make some significant trade-offs for all those gains in color and apparent resolution. While the Amiga has the hardware to execute HAM, the software needed to work the HAM mode properly is lengthy, complicated, and must perform many calculations. Thus, HAM programs are extremely memory-intensive (you definitely will need a megabyte of RAM or more). In addition, HAM mode software is characteristically slow. Some routines take so many calculations that real-time operation is impossible.

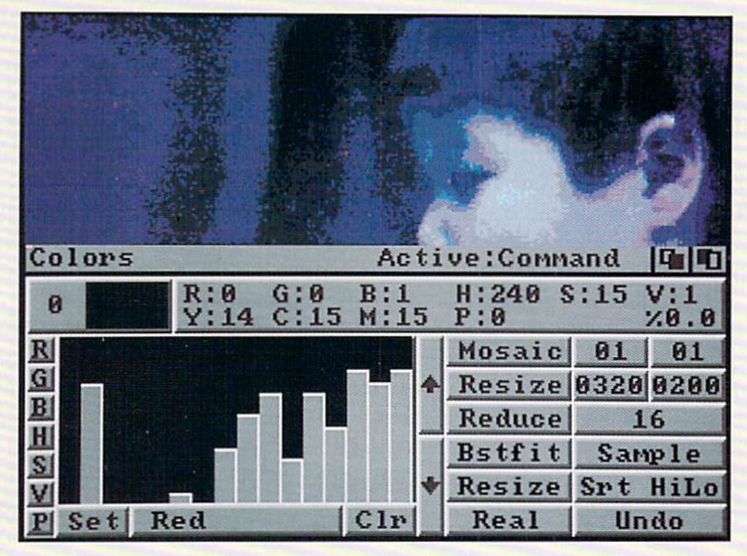
Still, all three of these programs go a long way towards further realizing the graphics potential of the Amiga. Interestingly, each of their developers has very different intentions regarding the use of its package. For instance, where Photon Paint is designed primarily to support the freehand artist, Deluxe PhotoLab may be of greatest help to the videographer, with Digi-Paint trying to do a balancing act between the two. With this in mind, let's see how these three contenders for the HAM market stack up ►

By Bruce Jordan

SCREEN DUMPS BY PHILADELPHIA VIDEO LAB







User-interface screens from the three paint programs. From top: Digi-Paint, Photon Paint, and Deluxe PhotoLab.

against each other when compared in five critical areas essential to the operation of any good graphics package.

Five Critical Tests

1. Screen Layout

Choices as to the layout of the screen among graphics programs can mean the difference between creative joy and irritating tedium. Bad positioning of tools and palette in a computer graphics package is like trying to paint while someone stands between you and your canvas. While none of our HAM trio is a real clunker on this score, some of the programs offer a more intuitive approach to screen layout than others.

Digi-Paint positions the toolbox, color controls, and HAM palette windows at the bottom of the screen. This turns out not to be the best choice. Instinctively, it makes the toolbox feel like a barrier, because you find yourself constantly closing and then reopening the toolbox to work with the lower third of the screen.

Both Deluxe Photolab and Photon Paint use smaller scale toolboxes and position them at the top border of the screen. This arrangement allows for more free drawing space. Both packages display only a 16-color palette, leaving the color controls and HAM palette hidden until needed. Photon Paint's switchblade-like extended toolbox opens or closes the color controls and HAM palette at the click of a gadget. Deluxe PhotoLab, on the other hand, addresses the problem of screen space by locating all color controls and the HAM palette on a completely separate screen. This turns out not to be a very satisfying arrangement, as we shall see later.

2. Surface Tone and Texture Controls

To achieve the greatest range of effects, graphics software must support routines providing adequate control of the tone and texture of plain, painted surfaces. This is especially true in HAM mode. Without these tools you have little more than an expensive electronic coloring book. Unfortunately, none of our three programs is outstanding in surface-texture control.

Both Digi-Paint and Deluxe PhotoLab offer an automated shading feature, controlled by a gadget, that allows you to position a single highlight and to set the degree of dithering (the mixing of finely interspersed pixels of different colors) used in the shading effect. While these functions are adequate for simple, geometric shapes, for more complex shapes—say, a flowing ribbon—they produce inaccurate results.

Deluxe PhotoLab also offers a gradient fill with dithering control. This allows an area to be filled with a spread of color. While this is an interesting effect, it is not much more useful than the automated shading tool.

Of the three packages, Photon Paint's Blend feature allows the best control. Instead of providing a single, simple highlight, Photon Paint enables you to set ►

HAM: Color By The Numbers

UNDERSTANDING HAM (Hold-and-Modify) mode requires a grasp of how your computer displays graphics in any mode. Any Amiga graphics display is defined in a bitmap—a set of rectangular planes of bits found in the Amiga's graphics memory. Normally, the Amiga display system determines the color of a particular pixel by stringing together the corresponding bits from the planes of the bitmap and using the resulting number as a pointer to one of the 32 Amiga color registers. The registers contain 12 bits of information (four bits each of red, green, and blue information) that determines the actual color of the pixel. The registers can be set from any program.

In HAM mode, this straightforward arrangement is altered. A HAM display uses six bitplanes, with the bits in bitplanes 5 and 6 having a special function. If the bits from bitplanes 5 and 6 for a particular pixel are both 0, then HAM mode uses the bits from the first four bitplanes to point to a color register (0–16), just as the normal Amiga display modes do. It is when one or both of these two special bits are set to 1 that HAM differs from normal Amiga display methods.

The color of a pixel in a HAM display depends upon the color of the pixel to its left. In HAM mode, two of the three color values that make up a pixel are held constant—they are the same values used by the previous pixel—while the third color value is determined by the corresponding bits in bitplanes 1 through 4. The color values that are held, and the one that is modified, are determined by the values of bitplanes 5 and 6.

If the bit in plane 5 is 1 and the bit in plane 6 is 0, the red and green values of the previous pixel are held while the bits in planes 1 through 4 are used as the current pixel's blue values. If the bit in plane 6 is set to 1 while the bit in plane 5 is 0, the blue and green values of the previous pixel are held and the bits in planes 1 through 4 determine the red value of the current pixel. If both bits in planes 5 and 6 are set to 1, the red and blue values of the previous pixel are held and the bits in planes 1 through 4 define the green component of the current pixel.

Using this method, programmers can display all 4096 Amiga colors at the same time. Because it takes more calculations to determine the color values of a HAM pixel, and because the colors of HAM pixels are not mutually exclusive, it takes much more time to create and update HAM images than normal Amiga images. On the plus side, HAM images are often more lifelike and striking than standard images because of the wide range of colors available. □

—Bob Ryan

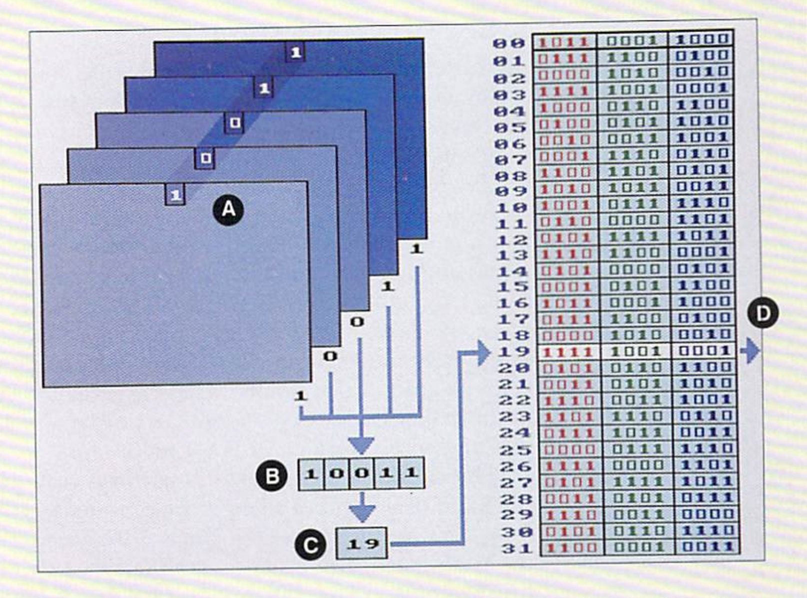


Figure 1. A Standard Amiga Graphics Display. Corresponding bits from the bitplanes (A) that define the picture are strung together to form a five-bit binary number (B). This number—translated here (C) into decimal—points to an Amiga color register. The color values in the register are output to your monitor (D).

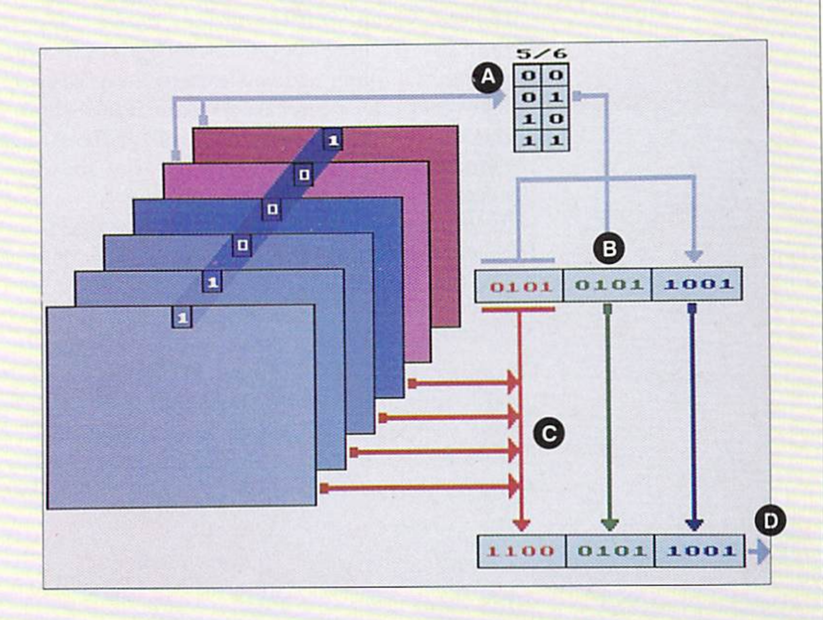


Figure 2. A Hold-and-Modify Display. The corresponding bits from planes 5 and 6 are examined (A). Based upon these bits, the blue and green values of the previous pixel (B) are held or repeated, and the red value of the new pixel is taken from bitplanes 1 through 4 (C). The resultant color values are output to your monitor (D).

shading profiles in both horizontal and vertical directions. This allows for complex, multiple-highlight positioning, giving images the look of being illuminated simultaneously from several different directions. Photon Paint even offers a plaid shading pattern, which can be used to quite interesting effect.

3. Resolution and Speed

All three programs suffer, to some degree, from the inherent slowness of working in HAM mode. With the numerous lengthy and complex calculations necessary for HAM, the programs require a great deal of time to achieve their colorful effects.

In the speed category, Digi-Paint is painfully slow, allowing no real-time drawing. For instance, rendering something as simple as a quick squiggle produces a Wait requester while Digi-Paint decides where to place the color. Digi-Paint also suffers from severe HAM stepping errors: thin borders of inaccurate color around drawn shapes. These arise as a result of the inability to change more than one color value at a time when working in HAM mode.

Photon Paint is fast enough to perform real-time, freehand drawing, but when it comes to many of its other features, it still leaves much to be desired in terms of speed. For instance, cutting out a custom brush or performing a fill produces the dreaded Wait requester, as Photon Paint takes a detour through calculation land. Photon Paint also has its own share of stepping errors, although these are not nearly as bad or as frequent as with Digi-Paint.

Deluxe PhotoLab is the winner in the categories of both speed and resolution. Drawing is in real time, and most of its other features are executed reasonably quickly. Stepping errors are virtually nonexistent. In addition, PhotoLab functions in all of the Amiga's resolution modes, allowing you to draw in a lower resolution, with the same ease and speed you might with DeluxePaint (albeit, a rather limited version of DP), and then convert your picture into HAM mode for further detailing.

4. The Palette

Obviously, the control of color is important to any good paint program. With HAM's 4096 possible colors, such control becomes absolutely crucial. All three packages display a standard palette of 16 predefined colors, but only Digi-Paint and Photon Paint offer the 4096-color HAM palette windows on the main drawing screen. Choosing a custom color with either of these packages is as simple as pointing and clicking on a particular color within the rainbow-like HAM palette windows, or fiddling with the RGB controls. Photon Paint offers additional color mixing via its HSV (Hue, Saturation, and Value) controls. Photon Paint also allows for the creation of color spreads, while Digi-Paint does not.

Deluxe PhotoLab provides a completely different color-control strategy. In HAM mode you are presented with a palette consisting of only the 16 predefined colors. If, however, you wish to change colors, to create a spread of colors, or to access the HAM palette windows, you must close the drawing screen, or pull it down out of the way, in order to access the Color Control screen. Unfortunately, this design could force you to mix your colors while much of your artwork is out of sight—rather annoying when you are trying to get just that perfect shade of some particular color.

5. Custom Brush Control

The custom brush serves the same purpose in computer art that stencils, templates, and drawing guides serve in more traditional art. With few exceptions, each package has its own particular ideas on custom-brush support. All three packages, of course, allow brushes to be saved to disk.

Digi-Paint allows you to either cut out a brush freehand, using a scissors icon, or to grab a brush using any one of its various shape-making tools: square, oval, circle, and so forth. Once you have your brush, it can be stamped on the screen and used with the various color-modifying functions, including tint, add color, subtract color, and blend, to name only a few of the many functions available. Digi-Paint does not, however, allow you to hold down the mouse button and actually draw with your custom brush.

Although Photon Paint also limits you to the rubber-stamp approach when working with custom brushes, it does provide several innovative tools for modifying custom brushes. You can automatically wrap your custom brush onto a number of predefined shapes—cylinders, cones, spheres, and a variety of cubes—and you can even wrap brushes around user-defined shapes. In addition, you have control over the direction and intensity of the apparent light source illuminating your custom brush. Photon Paint also allows custom brushes to be tipped by controlling the pitch, roll, yaw, and apparent distance of the brush from the observer.

Deluxe PhotoLab allows freehand cutting of custom brushes, as well as the standard rectangular cutout; it is the only package of the three that allows you to actually draw with a custom brush in HAM mode. The process, however, is so impossibly slow (we're talking snail's pace here), that it is surprising Electronic Arts ever decided to support this feature in the first place. Another unique PhotoLab feature ►

Product Information

Deluxe PhotoLab	**Digi-Paint**	**Photon Paint**
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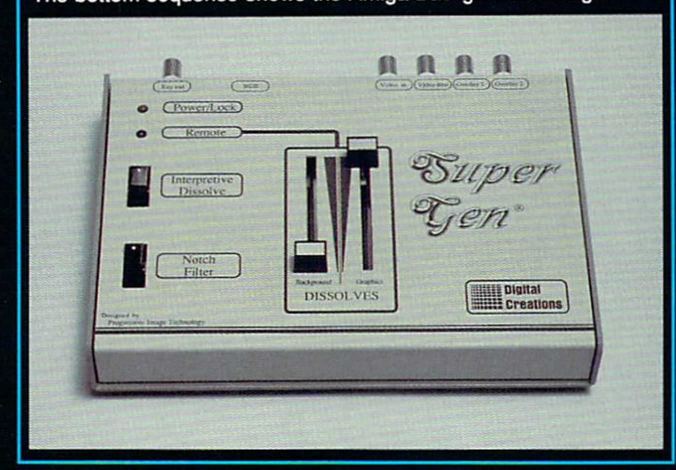
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is the ability to fill shapes with custom brushes—a neat feature if you happen to be in the wallpaper business. PhotoLab also sports a limited version of the custom-brush tipping feature contained in Photon Paint.

Up Close and Personal

So far, we have compared the three programs on the common ground of our five criteria for good graphics packages. Yet, as we said at the beginning, the use intended for each of these programs is different, thus making a straightforward comparison difficult. To make an evaluation as to which program may be best for your particular needs, let's take a closer look at each package on its own individual terms.

Deluxe PhotoLab

It may not quite be the ultimate HAM graphics package, but it's close. I believe Electronic Arts' intention with PhotoLab was to create a graphics environment for the high-end, graphics/video user. The package is actually a collection of three separate programs: Paint, Colors, and Posters.

Paint is designed to allow users to manipulate and bring together all levels of resolution of graphics supported by the Amiga, thus providing for the widest range of possibilities. For instance, digitized images can be used with genlock processing and freehand drawings made in any resolution mode.

Colors, an image-processing program, can analyze a picture by its various colors and pixel populations, perform color separations in either RGB or cyan/magenta/yellow, convert a color image to its black-and-white equivalent, alter colors, and even change the format of a picture from, say, lo-res to HAM or HAM to lo-res. Colors would be a valuable tool for serious videophiles, or for artists interested in high-end reproduction of their electronic artwork.

Posters is essentially a printer-support program. It allows you to string together several separate pictures to form posters as small as a postage stamp, or as large as a ten-foot-by-ten-foot mural. Posters also has the ability to perform anti-aliasing (removing the jagged edges around images) while printing.

Is Deluxe PhotoLab the ultimate graphics package? The answer may be a strong "yes" if you do lots of video work, but a resounding "no" if you are a free-hand artist. If your requirements are strictly in the latter category, Electronic Arts' own DeluxePaint II will probably be more useful than PhotoLab.

Digi-Paint

If we judge Digi-Paint strictly as a stand-alone paint program, the results would not be favorable. I believe, however, that NewTek never intended that it be used as such. As a support package to NewTek's popular Digi-View video-input system, Digi-Paint becomes a ►

clever add-on, giving you lots of power to adjust and manipulate your video images. Digi-Paint can spiff up existing IFF pictures created with conventional painting programs. Once converted to HAM mode, lower-resolution pictures can easily be altered and improved using Digi-Paint's various utilities.

Also, in preparing this article, I spoke with NewTek officials who told me that they intend to release a new version of the program, Digi-Paint II, in March '89. While I have no hands-on knowledge of the software as of this writing, I can report that the company is enthusiastic about proposed features of the new program, such as 3-D image mapping, full overscan capabilities, super fast response, 1204 × 1204 bitmapping, and automatic anti-aliasing.

Photon Paint

Of all three packages, Photon Paint is the one designed to offer the greatest capabilities and power to the freehand artist. If your intentions are to create artwork from scratch using a HAM mode package, Photon Paint is currently the program to choose. But again, best use of the package may be made in conjunction with another, more conventional paint program. Like Digi-Paint, Photon Paint allows the importing of any resolution picture in IFF format. Therefore, although Photon Paint is fast enough to make freehand drawing possible, you will still be better off to create your initial artwork in the conventional paint program, and then jazz it up using Photon Paint's powerful assemblage of HAM tools.

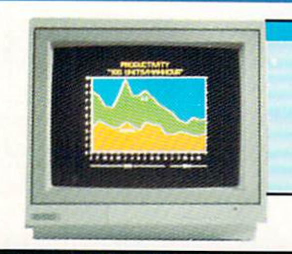
Better HAM to Come?

So where do things stand with regard to HAM graphics software? Although the real-time barrier for HAM mode has yet to be broken, HAM is definitely the wave of the future. As interest in HAM technology increases, and as accelerators and math coprocessors become cheaper, developers will write software that will take advantage of the potential of such hardware to speed up HAM calculations. The result should be that we get much improved, faster HAM programs at affordable prices.

Until then, freehand artists should keep in mind that there is still plenty of power, speed, and usefulness left in those old, conventional paint programs. For now, HAM, although powerful, serves the artist better as an enhancer rather than a creator. On the other hand, if video is your area, HAM graphics software can be put to excellent use right now in providing you with flexible control over your high-resolution video images. ■

Bruce Jordan is a frequent contributor to Amiga and C64/128 publications. He also worked on the development of the Super-Forth programming language. Write to him c/o AmigaWorld, *Editorial Dept., 80 Elm St., Peterborough, NH 03458.*

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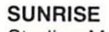
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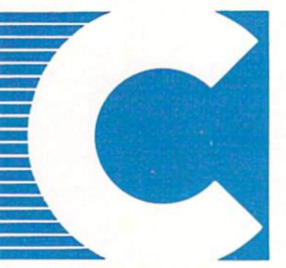
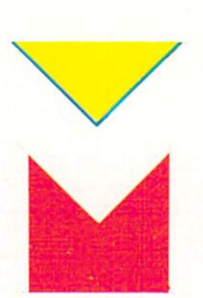
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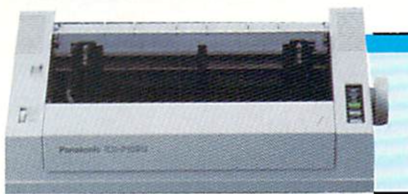
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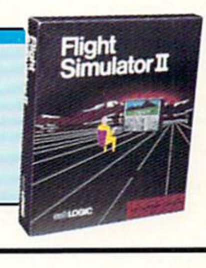
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From Screen Image To Finished Illustration

#3



An occasional series of tips, techniques, and tricks for creating more imaginative Amiga graphics.



By Joel Hagen

THE COMPLETE BEGINNING-to-end task of creating computer graphics and producing the finished product in published form is one of the more challenging—and satisfying—exercises for the Amiga artist, professional and amateur alike. While this series so far has concentrated on tips and techniques for creating the images themselves, a look at the unique problems of actually producing those images as finished illustrations will be of real practical value.

While pictures created on the Amiga are clear, bright, and crisp when viewed on the monitor, getting those same images into publishable form is another matter. A recent book assignment of mine may serve to illustrate this dual aspect of the computer graphics process. Because the reproduction side of things proved more problematic, we will examine that part of the project first and then work back to how I actually composed the images in the first place.

My assignment involved illustrating a series of six science fiction novels about an adventurous, space-faring archaeologist of the future named Dr. Bones. Each book contains 12 illustrations providing a "computer data bank" section of black-and-white images as a visual supplement to each story. Ideally, the publisher wanted finished hardcopy illustrations, ready to shoot. The fact that the visuals were supposed to be computer screens made the project a perfect Amiga experiment. I felt the computer could be the appropriate tool for the entire job, making the task of doing so many illustrations faster and more interesting.

Problems cropped up, however, as I began sending preliminary tests to the publishers in various forms. Screen shot transparencies looked great, but when the publishers enlarged them as halftones, the visual quality deteriorated to an unacceptable level. Printer output seemed the best solution, although my own 24-pin printer was out of the question. While fine for high-contrast images, when it comes to gray levels—even with the new drivers—it does not produce publishable quality. I tried outputting to an HP laser printer and was again disappointed. The dithering algorithms produced a gray scale that looked like a sampler of plaid patterns from a kilt maker.

Although I was prepared to accept a bitmapped "computer screen" look to the finished illustrations (it seemed appropriate to the theme), I was just not getting satisfactory results. At the time I was doing these initial experiments, PostScript was new to the Amiga community. None of the software supported it yet, but I had been impressed with PostScript output from the Macintosh. PostScript interprets gray-scale information as larger or smaller dots in the finished picture. From a LaserWriter, the results are similar to an 85-line screen—about the same image quality you see in a newspaper photo. A Linotype machine gives even better results.

I located a shareware PostScript converter for the Amiga called IFF2PS by William Mason and Sam Paolucci. They used it to print out a couple of my images on a LaserWriter and the results were beautiful. IFF2PS is simple to use, and I highly recommend it. It does its job without any frills, and does it well. IFF2PS reads any IFF ILBM (Interchange File Format / Interleaved Bit-

Making your illustrations look as good on the page as they do on your monitor can be a tricky proposition.

map) picture file and converts it to PostScript format. This can be output to a laser printer as it is being converted, or stored on disk for printing later. There are several options that help automate this task. I sent the test pictures to the publishers who reported they could use the printouts without any reshooting in their final layouts. The main problem was solved. (See Figure 1 for a comparison of the screen image and its PostScript printout for one of the *Dr. Bones* illustrations, "Temple Carvings.")

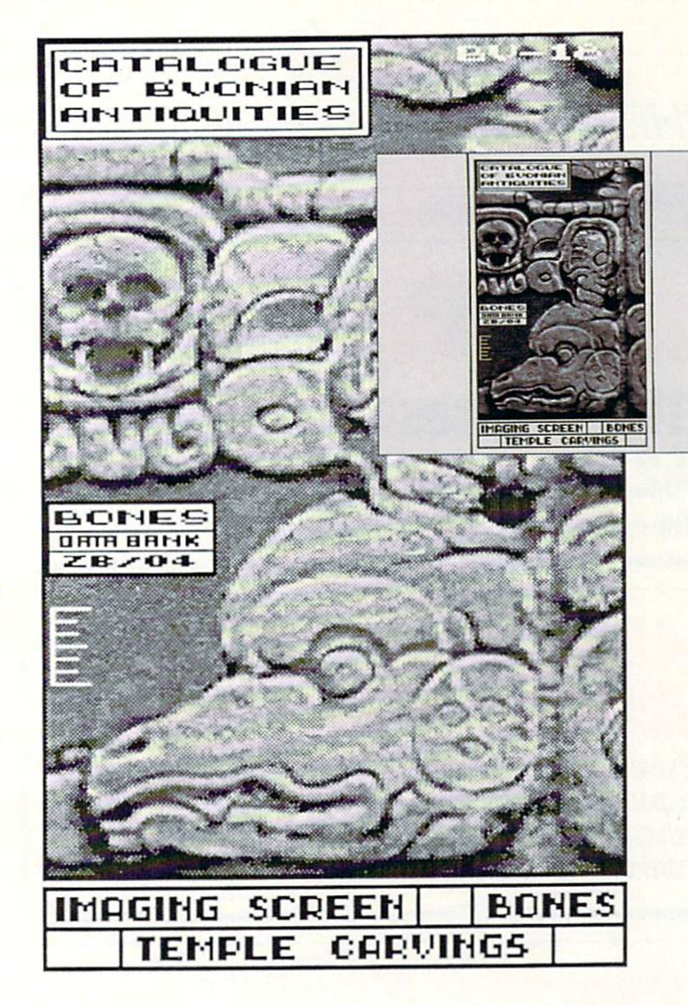


Figure 1: Comparison of screen image (left) of "Temple Carvings" with its PostScript printout (right). The illustration is from book three of the *Dr. Bones* series, Byron Preiss Visual Publications, Inc. for Ace Books. Copyright 1988 Byron Preiss Visual Publications, Inc.

Back to the Drawing Board

With 72 illustrations to produce, I took every advantage of the Amiga to save time and effort. Using DeluxePaint, I worked in the 320×400 interlace mode to give me good resolution with fast response time and full tool use. I created a master screen containing a "book page" work area of appropriate size and proportion. Within this page, I laid out a framed image area and a caption bar at the bottom. This would be the starting point for every illustration, providing the consistent look of the "computer data bank" section. I created a toolkit of visual elements I would be using repeatedly. These included grids, gray scales, ID chops, reticle patterns, and so forth. I arranged these on the master screen where they were always accessible and could be quickly picked up as brushes and moved into the illustration. I left empty space on the screen, both as a scratch pad area and for entering text. I arranged the first 16 colors of the palette as a sequential gray scale and established it as a Range so I could make effective use of Shade and Blend tools. This master screen could now be loaded to begin each new picture, eliminating any setup time. This is a unique strength of the computer.

I decided to keep an illusion of realism to the series of illustrations. I did not always draw or paint the images from scratch as I might have with paint or pencil. Instead, I often made use of Digi-View to give me a digitized image as a starting point. I then used the unique features of DPaint to completely alter these images, while retaining the photographic look. In the "Temple Carvings" illustration (Figure 1), I began by digitizing Mayan carvings. I erased much of the image to focus on a human face. Using Blend, I "pushed" the image into the reptilian features appropriate to the plot of the book. (See Accent #2, Feb. '89, p. 42, for more about using the Blend tool in this fashion.) I used Shade to add carving lines, highlights, and shadows. Picking up small areas of untouched rock texture from other parts of the picture, I stamped them sparingly on the new features I had created, using the X and Y keys to flip the texture and thus preventing a repeating pattern. Using the same technique, I "drew" new carvings elsewhere in the image. I added the caption, pulled in symbols from my scratch pad toolkit, and saved two copies of the finished picture.

Converting these IFF files to PostScript packs six image files on each disk. With a LaserWriter on the serial port, the command COPY filename TO SER: starts the ball rolling. By using CTRL J after each COPY command, the Amiga queues up the commands allowing you to leave the machine unattended while it finishes one or two disks full of images.

Overall, the initial period of experimentation took time, but the method that evolved is quick and produces clean results. It doesn't fight the limits of the computer, it capitalizes on them. ■

Joel Hagen's credits include work in art, astronomy, science fiction, and software development. Write to him at 10512 Sawyer, Oakdale, CA 95361.

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SPRUCING UP THE OLD BENCH—1*

Preferences: A Top-Drawer Act

With a drawer of its own and a fistful of new tools, 1.3's Preferences offers improved overall control of your system.

By Mark L. Van Name and Bill Catchings

**Editor's Note: This month* info.phile *begins a new AmigaDOS 1.3 "mini-series." While the previous collection ("Exploring AmigaDOS 1.3," August '88–December '88) focused on new or improved CLI commands, this series tackles the other side of the AmigaDOS coin: the Workbench. 1.3's Workbench includes a number of brand-new programs and utilities, and improved features for some of those carried over from version 1.2. These changes will be the subject of the next several* info.phile *columns.*

A FUNDAMENTAL WORKBENCH tool, Preferences still performs the same job of letting you control many of the basic aspects of your Amiga, but it now offers you some new tools for accomplishing that task. In addition, you will find it in a new location. While in 1.2 the Preferences icon appeared when you opened the Workbench disk, you will now find it when you open the new Prefs drawer.

This drawer also contains four new icons: CopyPrefs, Pointer, Printer, and Serial. CopyPrefs is something new, and we will take a look at it in just a moment. The other three are shortcuts into their respective Preferences windows. Double-click on Pointer and up comes the Preferences Edit Pointer window. Similarly, the Printer icon takes you to the Change Printer window, while the Serial icon lets you into the Change Serial window. You can still get to any of these windows in the old way, of course; start Preferences and pick the gadget for the window you want. The new icons simply eliminate that extra step if you want to go to one of their windows directly.

The new icons, however, do not save you any work when you are ready to exit those windows. When you click on OK or Cancel in any of these windows, you end up in the main Preferences window. There you must choose to Save, Use, or Cancel your changes. The only way to save or use your changes is still to pick the appropriate menu option from the main Preferences window.

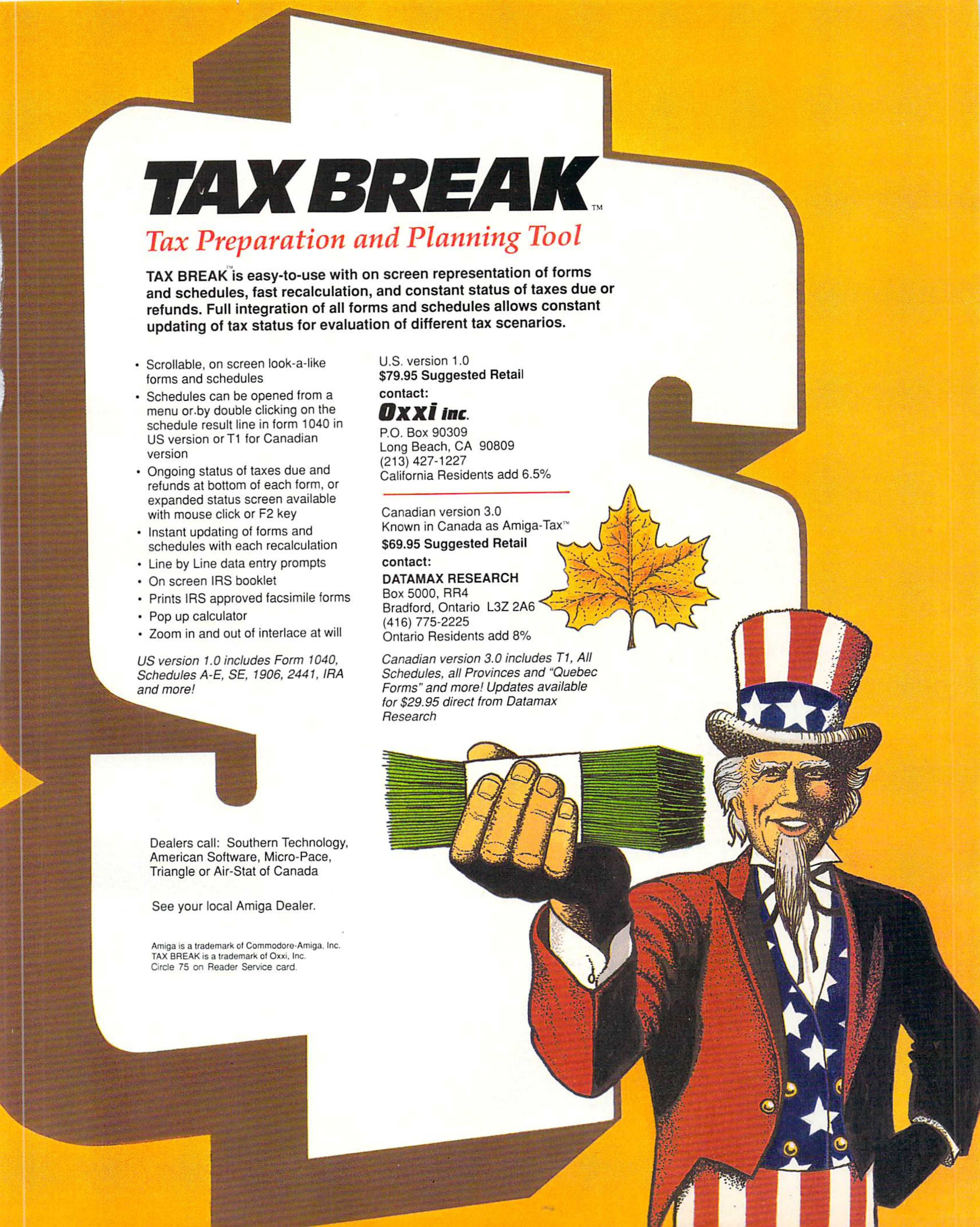
The Preferences windows for the Serial and Pointer icons remain the same as they were in AmigaDOS 1.2. The main and Change Printer windows, however, are different. The former sports two new changes, one visible and one hidden. You will notice immediately that the CLI On/Off gadget from 1.2 is gone. You now get both a CLI and a Shell by default.

The hidden change matters only if your Amiga has a battery-backed clock/calendar. If it does, when you change the date or time in Preferences and then save your changes, Preferences automatically sets the clock/calendar to the new date and time.

NEW GRAPHICS PRINTER CONTROLS

The improvements to the Change Printer window may at first glance appear equally minor, but don't be misled: There's a lot more under the hood. The only visible change is that the Graphic Select gadget of the 1.2 Preferences is now two gadgets, Graphic 1 and Graphic 2.

Click on Graphic 1 and you will find yourself in a window that is essentially the same as the old Graphic Select window. The only difference is that there is one additional Print Shade option: GrayScale2. This option makes it easier for owners of Commodore's new A2024 monochrome monitor to translate their screen images into printed output, because the A2024 supports four shades of gray. ►



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While the Graphic 1 window may be familiar, Graphic 2 is all new. It contains ten gadgets that let you control some of the Amiga's extended graphics printing features.

These new gadgets fall into three basic groups. One group provides control over the size of the printed image. With the Width Limit and Height Limit gadgets you can restrict the image's size. Whether your Amiga actually obeys those limits, and how it interprets them, depends on how you set the <—Limits gadget. A scaling gadget allows you to tell your Amiga to shrink or grow the image.

The second group of new gadgets affects the placement of a printed image on the page. With the Left Offset gadget, you can shift the image left—effectively setting a left margin on the paper. You can also center the image with the Center gadget.

The final set provides you with control over many aspects of the image's quality and appearance. You can specify the printing density with the Density gadget; obviously, less dense images print faster, but they may not look as good as more dense ones. You can also tell the Amiga to match the on-screen image colors as closely as it can with the Color Correct gadget. Two other gadgets, Smoothing and Dithering, give you finer controls over how the Amiga defines the outline and color, respectively, of the printed image.

WHERE DID ALL THE PRINTERS GO?

One big shock you are likely to encounter when looking at 1.3's Preferences is that all but one of the printer drivers have vanished from the Workbench disk. 1.2's Preferences contained a list of every printer supported because all of their driver programs were on the Workbench disk. When you bring up Preferences on the standard 1.3 Workbench disk, there is only one printer in the list: Generic.

Don't worry, though; they have not disappeared entirely. All of the old printer drivers, as well as some new ones, are now on the 1.3 Extras disk that comes in the 1.3 Enhancer Software package. The 1.3 Workbench disk was so full that there was simply not enough room for them there.

Assuming that you have either a hard disk or enough room on your Workbench disk to hold the printer drivers you want, you can copy them from the Extras disk to the DEVS:printers directory of your Workbench disk and be back in business.

You can do that copying in two ways. If you are a Shell or CLI user, try the following COPY command:

```
COPY "Extras 1.3:devs/printers/
    <driver name>" TO DEVS:printers
```

where <driver name> is the name of the printer driver you want. (This command assumes that your Workbench disk is in one drive and your Extras disk in the other. If not, or if you have a one-drive system, AmigaDOS will prompt you to put the needed disks in the drive(s) at the right times.)

Of course, if you don't want to mess with the Shell, this approach is not for you. Fortunately, Commodore has included a new utility, InstallPrinter, that will do the job for you. To find it, open the Workbench's Utilities drawer. Double-click on the InstallPrinter icon and a window will appear displaying a list of all ►

the printer drivers on your Extras disk. (Again, have the Extras and Workbench disks in your drives or be prepared to put them there.)

Now pick the one you want, type its name at the prompt

Which printer ? (press RETURN to exit)

and press RETURN. If you understand the CLI-style filename wildcards, you can also use them here. Once you enter a printer driver name, InstallPrinter will do the copying. As it works it will print these two messages:

Now copying your printer choice to devs:printers.
Now choose this printer using Preferences.

It then will exit and send you back to the Utilities window. If you change your mind and want to exit this program without doing any copying, hit RETURN without entering a printer driver name.

Help for Hard Disk Users

InstallPrinter is not the only handy new 1.3 utility. CopyPrefs, the new icon found in the Prefs drawer, is designed to help those of us who make changes in Preferences and have hard disks that won't autoboot. To understand why we may need help, consider the following possible chain of events.

Because your hard disk cannot autoboot, you boot off your Workbench disk, which causes your Amiga to use the Preferences information stored on that disk. (Preferences stores its information in the file system-configuration in the DEVS: directory.) Then, in your startup-sequence file, you ASSIGN the important directories, including DEVS:, to their hard-disk counterparts, and then CD to your hard disk for your real work.

While you are working there, you bring up Preferences, make some changes, and click on Save. Preferences saves those changes to the file system-configuration in DEVS:, which is on your hard disk. So, when you next reboot off your Workbench disk, none of the Preferences changes you made are on that disk, and you're out of luck.

CopyPrefs is an easy way out. When you run it after saving changes in Preferences, it copies the system-configuration file from your current DEVS: directory to DF0:devs. As long as you put your Workbench disk in drive DF0: before you run this program, you will be all set. Next time you reboot off that disk you'll have the updated Preferences.

CopyPrefs is very easy to run; just double-click it. It will open a window titled IconX and display the message

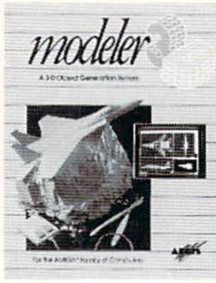
Coyping devs:system-configuration to DF0:DEVS

and then do the copying for you. When it's done, the window goes away and you are back in the Workbench.

The reason the CopyPrefs window is titled IconX is that CopyPrefs is actually a Shell batch file, and IconX is the name of the 1.3 program that lets Workbench users execute batch files. One handy side effect of this fact is that you can edit CopyPrefs. For example, if you are rebooting from the RAD: recoverable RAM disk, you might want to add a second line that copies system-configuration to RAD:DEVS as well.

Tune in next time for a closer look at the new Preferences printer options. ■

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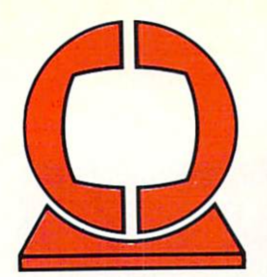
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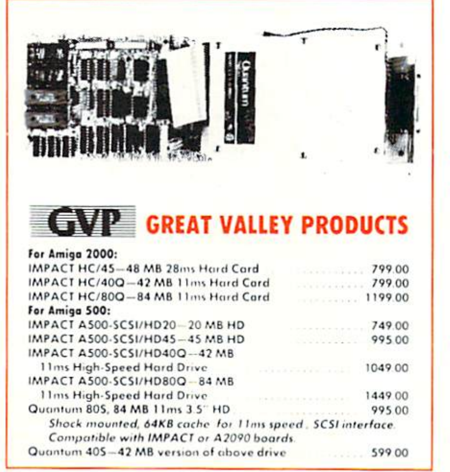
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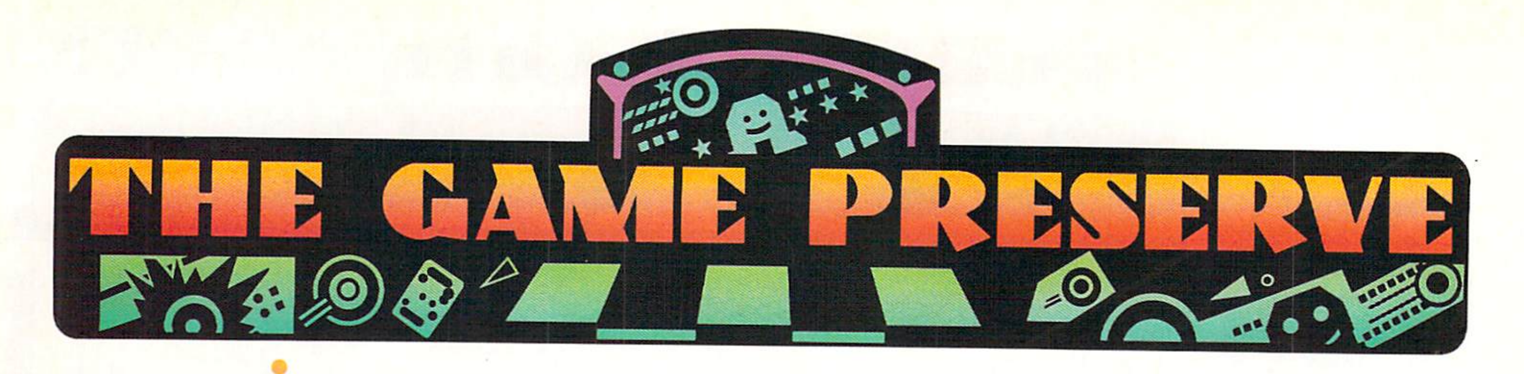


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EACH MONTH, B.G. (Big Game) Hunter is on the prowl for great games or the game's greats.

The Great One

See what's hot on ice.

By B.G. Hunter

HOCKEY WILL NEVER be the same. Last summer, Wayne Gretzky left the Edmonton Oilers to play for the L.A. Kings. Through winter rumors I learned he was moving again—to the Amiga in Bethesda Softworks' Wayne Gretzky Hockey. Impatient with waiting and hype, I forced my way into software's pregame practice session, the beta version, for a preview. As I feared, the game suffers from typical beta bugs, but it's dynamite nonetheless.

Even the opening credits are fun. A hockey player two-thirds the height of the screen skates to a puck in the center of the monitor. He pulls back his stick and takes a slap shot right at you. The crowd roars. The puck grows as it flies at you, and then it bursts through the monitor! The screen breaks, and shards of glass fly everywhere. (Who got to break a TV screen to get that digitized sound, and how can I sign up?)



All the action (and emotion) of real hockey.

Your view of the game itself is from the rafters.The screen displays two-thirds of the rink and a few rows of fans above it. The rink scrolls as play moves up the ice. When your players are standing still, you see helmets, shoulders, and hockey sticks. When a player skates, however, little legs flick out behind his body. (They even dance with anticipation at the face-offs.) The graphics could be better, but they are a step up from the colored-circle players of Bethesda's earlier game, Gridiron.

You can control any player, except the goalie. The mouse control, however, takes practice to master. Your mouse directs an X on the screen; move the X and your player skates toward it. He skates faster when the X is farther away. To pass or shoot, press the left button, move the X where you want the puck to go, and release the button. Once you get the hang of it, the motions become second nature.

As I played, I noticed many little things that make a good game great. The crowd roars when a player takes a shot. Watch closely: as the players move, their skates leave white tracks on the light blue ice. When ►

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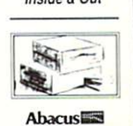
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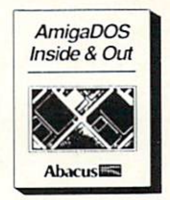
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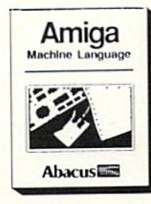


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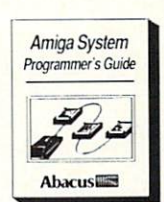
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each period ends, most of the ice is white. The big-screen, overhead scoreboard shows you the team filing out to the locker room. Out rolls the Zamboni to clean up the ice.

Two Minutes for Roughing

Most of all, the game is true to hockey. Want to check a player? Click the mouse as you run into him. Hit him hard enough and you can savor the image of him sliding spread-eagle across the ice. You are also liable to see the referee on the overhead scoreboard giving the official signal for a penalty. Tripping, high-sticking, elbowing—I've had them all. Be prepared to sit out your five minutes for fighting, too. At least you can watch the action on the overhead scoreboard as two players hit each other for no apparent reason.

To top it all off, this game has tons of customizing options and keeps enough statistics for even the most maniacal sports statistician. Each player has twelve characteristics, such as position, aggressiveness, quickness, checking, passing, and shooting. You can play, coach, or both. You can set up your lines, including penalty-killing and power-play lines. You can handicap yourself, your opponent, or the computer. You can even save your game and restore it later.

The replay facility is my favorite; it's wonderful, particularly after a goal or a penalty. The replay goes back ten seconds or to the previous face-off, whichever was more recent. You control a slide bar marked Forward at the top and Reverse at the bottom. Move the sliding line to the center and the action stops. You can back up the game to the desired point, then watch the play very slowly unfold again. It's a great way to learn what you just did wrong or to enjoy again the murderous check you put on some poor soul.

Don't get me wrong: This game is not perfect, but most of the flaws I found were related to the fact that I was playing a beta version. For example, my team's coach assembled some weird lines. One time I had the same player at both center and right wing. I also ended up with some amazingly wimpy players. One was exhausted after spending two minutes in the penalty box! I've never actually sat in one, but it doesn't look like hard work.

More annoying was the fact that the version I played had only two teams, the Washington Capitals (Bethesda Softworks is in Maryland, so I can forgive them a little local color) and the New Jersey Devils. The Devils? Where are the L.A. Kings? It *is* Gretzky's game, after all. Who are those Devils players, anyway? Fortunately, Bethesda promises that the final version will include four great Stanley Cup teams. The company also plans to sell data disks of all of the 1987 and 1988 NHL teams.

My final complaint is that currently you can't administer a whole league, although Bethesda plans to add this before the game's release. According to the company you will have a module of "commissioner" functions, such as trading and creating new teams.

Still, it's hard to complain, because Bethesda plans to address all of my gripes in the final version. It's great to see a game that's so faithful to real hockey. Once again Gretzky proves why he is The Great One. □

Although not the type to be caged in an office, B. G. Hunter does skulk in occasionally to pick up his mail. Write to him c/o AmigaWorld, *Editorial Dept., 80 Elm St., Peterborough, NH 03458.*

Wayne Gretzky Hockey
Bethesda Softworks
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Rockville, MD 20850
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G A M E R E V I E W S

Dungeon Master

By Louis R. Wallace

DUNGEON MASTER IS a role-playing adventure that carries you and your troop on a mission to recover the Fire Staff, which Lord Chaos has stolen and hidden deep in a dungeon.

You choose your four party members from among many champions, each of whom has a unique set of characteristics. Each adventurer's skills, possessions, strength, and knowledge will increase during the course of your explorations.

Inside the dungeon, you will find weapons and armor that can help you survive fights. You must also find food and water; your people need to eat, drink, and rest regularly (the game is played in real time) in order to maintain their health and stamina.

Dungeon Master is completely mouse driven. The screen is divided into two sections: the dungeon display window and a menu-and-icon panel. Simply by pointing and clicking, you can select a sword from a character's backpack, for instance, and tell him how to use the weapon and how to attack. In the dungeon display, your mouse pointer appears as a hand. With it, you can pick up items, pull levers, press buttons, and unlock doors. You ►

can also carry and throw weapons with this hand, as in an arcade game.

Most characters can use magic, but a spell's success depends on the amount of Mana (magical energy) the character possesses and his knowledge of symbols and runes. You must figure out which spells are available and how to cast them. While scrolls scattered throughout the dungeon offer some clues, for the most part you learn by trial and error. On the icon panel are four groups of six runes. By combining the runes in various ways, you can cast a multitude of spells. To achieve proficiency, you must experiment with combinations; some do nothing, but others can help you overcome obstacles and creatures. The more spells you attempt, the more your Mana increases.

Footsteps warn of the monsters' approach...are you prepared?

You see the dungeon and its inhabitants—mummies, purple blobs, stinging rock-pile dwellers, and walking mushrooms (you can use the latter for food)—through the eyes of your characters. If you keep your ears open, however, you will often hear the monsters first through digitally-sampled sound.

I became more intrigued with Dungeon Master the longer I played. The animation, detailed-perspective graphics, and sound are excellent, and the menus and icons are easy to use. The challenge of learning the magic spells makes the game realistic. Dungeon Master is one of the best programs of its type. It is complex enough to hold the interest of the most seasoned role-player, and its simple interface makes it ideal for those new to fantasy adventures. I recommend it!

Dungeon Master
FTL Games
6160 Lusk Blvd.
Suite C-206
San Diego, CA 92121
619/453-5711
$39.95
No special requirements.

CARRIER COMMAND

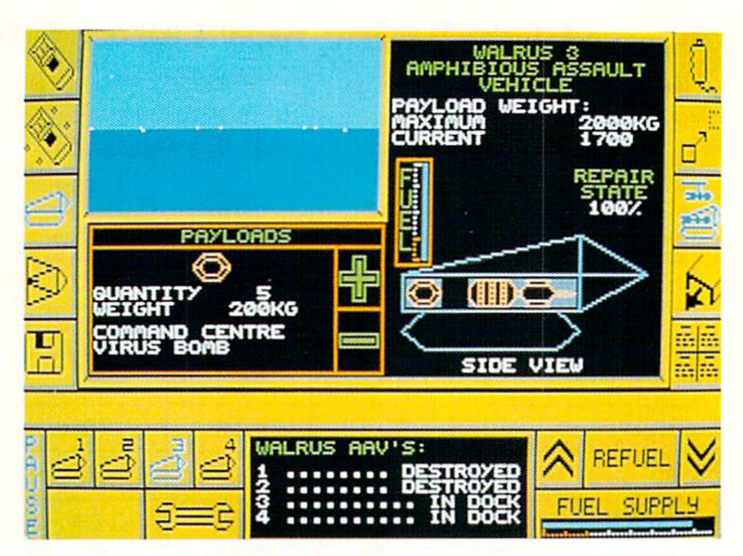
By Chris Dickman

AT THE HELM of a carrier transporting amphibious assault vehicles and fighter planes, you find yourself wreaking wholesale havoc in a 3-D arcade environment, strategizing all the way. Carrier Command's universe consists of about 60 mythical islands. Your mission is to establish a base on each one while the bad guys, equipped with a similar vessel, are bent on doing the same.

To track your progress, you can display a map that indicates the status of the islands (neutral, friendly, or hostile), as well as the colored network links between them. Prematurely attacking the enemy ship or its heavily-defended home island is deadly, so you must first colonize a group of isles around your home, then extend your network by creating protective clusters until you are in a position to make an assault.

You will need a resource island on which to construct mines, oil rigs, and fuel dumps. Output from these is shipped to factory islands for use in manufacturing weapons and refining fuel. Defense bases can protect other more vulnerable islands, and you can store constructed weaponry, fuel, and equipment on stockpile islands. All this stuff is shuttled through the network and finally to your ship. Meanwhile, the computer-controlled enemy is establishing bases for itself and trying to capture your colonies.

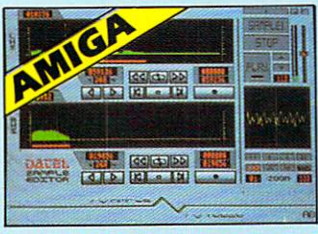
While engrossing, the colonizing process can become exhausting with its rigorous attention to detail. You must set a slew of priorities, for example, to indicate the rate at which the resource network manufactures replacement



You started your mission with four Walruses, but lost two in combat.

weaponry and fuel. Sound too much like work? Then it's time to take a break from colonizing neutral islands and launch an attack on a hostile one. To accomplish this, you can use the ship's cannon, but ►

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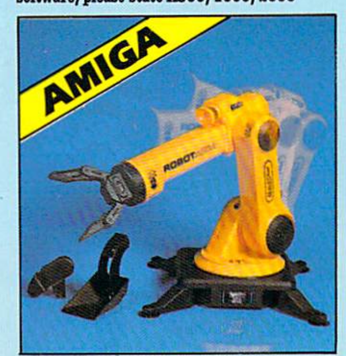
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you'll also want to engage an amphibious Walrus and a flying Manta—both of which carry a wide range of weaponry. The latter will be familiar to anyone who's piloted a flight simulator; its 3-D graphics and animation are very fast and smooth. You can dogfight with enemy aircraft, or swoop down and hammer vital installations (which blow up in a very satisfying manner). Although you can opt for a joystick, the mouse provides firmer control and is easier to use given the many icons throughout the program.

A game of Carrier Command typically takes days to complete. Combining the best elements of the arcade and strategy genres, it's one program you won't easily tire of.

Carrier Command
Rainbird Software
distributed by Mediagenic
3885 Bohannon Dr.
Menlo Park, CA 94025
415/329-0800
$44.95
No special requirements.

SWORD OF SODAN

By Bob Ryan

IN SWORD OF Sodan you take the part of a young hero (or heroine—the game is an equal opportunity destroyer) who attempts to avenge his (or her) father's death by storming Castle Craggamoore and obliterating Zoras the Necromancer. Your only weapon is your enchanted sword and the lessons you learned on your granddaddy's knee.

The movie-like game is divided into levels that correspond to the stages of your quest to destroy Zoras. You begin outside the city gates and must hack your way through the city and the castle until you reach the throne of Zoras for your final confrontation. Some levels require a brute force attack. Others demand delicate timing to avoid traps and obstacles. Finally, some levels require you to use magic items that you pick up along the way. Judicious use of these magic items—a zapper that kills your nearest opponent and a power



Sword of Sodan lets you meet interesting people.

shield that makes you temporarily invincible—spells the difference between success and failure. Use the magic on levels that don't require them, and you'll be in a terrible fix on subsequent levels. A winning strategy combines deft swordsmanship (with the joystick) with timely use of magic items.

The characters, backdrops, and digitized sounds are quite detailed and appealing. The profusion of blood and mangled flesh you leave behind in your quest, however, is reminiscent of a B-grade slice-and-dice flick. Parents should preview this game before buying it for the kids.

My major complaint about the game is the time it takes to load each level. Sword of Sodan is a big game—it is spread across three disks—with lots of graphics. It can take an eternity (in computer-game time, that is—equivalent to 10–20 seconds real-time) to load a level. An option to move the game to a RAM disk or a hard disk (greatly decreasing the amount of time spent watching the drive light) would be a welcome addition.

Although I was predisposed to reject this game as a mindless romp with sword in hand, I quickly became engrossed in developing a winning strategy. I have yet to succeed, but I enjoy trying. If you look past the gore and the slow load times, you will too.

Sword of Sodan
Discovery Software Int.
163 Conduit St.
Annapolis, MD 21401
301/268-9877
$49.95
Joystick required.

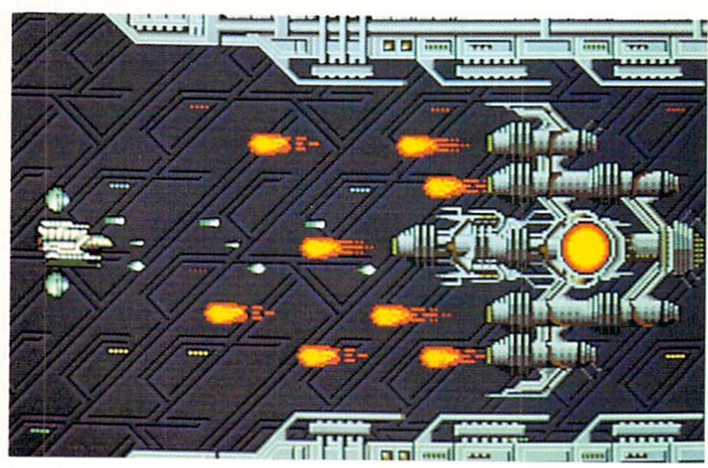
Menace

By Louis R. Wallace

MENACE IS THE pure, undiluted, and concentrated essence of arcade action. Your goal is to destroy six levels representing the different areas of the planet Draconia. There is an ocean, a graveyard, a garden, a futuristic city, an ancient city, and a mountain range. Created in 64-color Extra_Halfbrite mode and displayed in overscan, the highly-detailed, smooth-scrolling screens are nearly equal to coin-op arcade-game graphics.

Over 60 varieties of nasties—about ten per level—guard the planet. Most travel in groups, and each has a characteristic mode of attack. Some have no weapons, but you can be severely damaged just by contact with these (you can also suffer damage by touching the scenery). Others shoot projectiles, some of which can track you. Too much damage will cause your shields to give out, at which point almost any contact can kill you.

If you blast every member of a wave, a bonus cube appears. You can grab the cube for its point value, but if you shoot it several times, the cube will turn into an icon. These icons give you temporary advantages—lasers, cannons, ex- ►



The finale: Can you target the master?

tra acceleration, a force field, or a completely-restored shield. You can combine these attributes, and some of them are cumulative. Surviving all the waves on one level puts you face to face with a master guardian and his battery of soldiers. Only by destroying the guardian can you proceed to the next level, and to do so you must hit him repeatedly in one spot.

The animation is exceptional: enemies wiggle, roll over, rotate, rocket, undulate, fly, swim, bite, jump, and blast. My favorite is level three, the alien graveyard, with its skulls, ghosts, goblins, and bouncing heads. Digital sound effects, speech, and background music accompany the game. There are two levels of difficulty, and you can control your ship with a joystick or mouse. You can also save high scores to the game disk.

Menace's most unusual feature is its virus-free guarantee. A side effect is that Psygnosis will charge you to replace any disk damaged by a virus.

If you like hot arcade action, try Menace. It is challenging, highly addicting, and as good as any other arcade game I've played.

Menace
Psygnosis
1st Floor, Port of
Liverpool Bldg.
Pier Head, Liverpool
UK L3 1BY
051/236-8818

distributed by Computer Software Services
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TRACERS

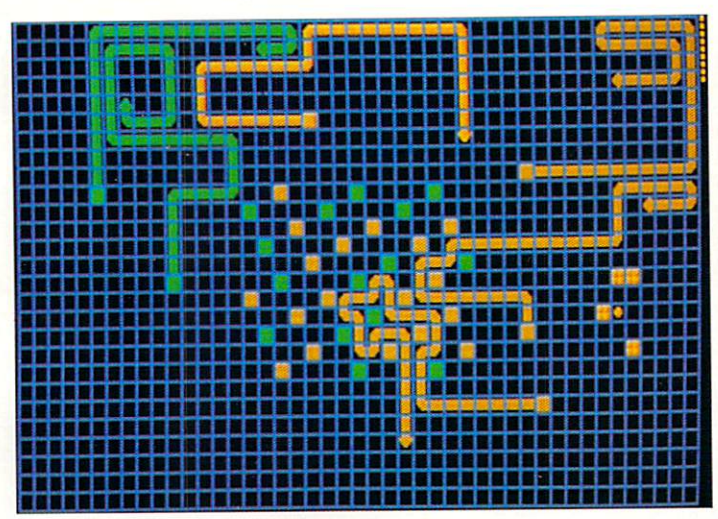
By Gary Ludwick

FUN, FAST, AND furious, Tracers is anything but mindless. As in the arcade-based Tron lightcycle game, you maneuver through a grid, and, with the trail you leave behind, you try to cut off or box in your opponent before he does it to you. To this concept, MicroIllusions has added enough new features to give the game a different flavor.

You can play against the computer alone or with a friend, or head-to-head with just your friend. You can opt

for joystick or keyboard, but I wouldn't face Tracers without a joystick. The music is excellent: There are several rythmns and tunes from which to choose. You can compete on any of 20 fields, and select the amount of power and number of lives to begin with. ades that destroy you on contact. Add your nefarious opponent, and you have one challenging game, even at the easiest levels.

Unfortunately, Tracers is copy protected. You can make a back-up copy, but when you boot it, you will find you have


Outwitting your opponents takes concentration.

All this adds up to a game you can tailor to your skills.

On the grid, you will find randomly-placed tokens that bequeath extra lives and additional fuel. Occasionally a short-lived death square appears; if you cross it, all your opponents immediately expire. A particularly ingenious feature is a block that travels on your trail: Can you time your moves just right and cross over this moving square? If so, you gain bonus points and break into a new area. There are various restricted areas, too, and block- a demo version with the words "Pirated Copy" emblazoned across the top.

Tracers is a winner. Its many variations and its quality presentation make it a rarity: a game that few people will tire of or master.

Tracers
MicroIllusions
17408 Chatsworth St.
Granada Hills, CA 91344
818/360-3715
800/522-2041
$34.95
No special requirements.

WARLOCK

By Chris Dickman

HAVE YOU EVER awakened in a sweat from a dream in which you are running but not getting anywhere? If so, you and I and the designer of Warlock's twelfth level have something in common, for at this level, your on-screen alter ego is pelted with a deadly blue fire by a projectile-tossing wizard. You shoot, but the wiz- ►

ard is an elusive target, so you race toward him. Every time you jump to avoid the missiles, though, you drift backward. All the while your vitality is dropping.

If working your way through scenes like this is your idea of fun, you will enjoy Warlock. As the warlock, you are in search of the stolen Karna, a jewel possessing magical powers. On the way to finding and doing battle with the Karna's thief, you must deal with an engaging band of adversaries—from zombies and kraken to the four elements—armed only with your trusty scepter. Luckily, eight magical objects are scattered en route (there are 20 screens with two levels each) to aid you in your quest.

The game is not novel, I admit, but Warlock stands out as a well-crafted member of its genre. The graphics are imaginative and nicely executed, scrolling between screens is very smooth, animation is crisp, and sound effects are varied. Above all, it has that elusive, satisfying feel that lets you completely lose yourself in the alternate reality on the screen.

As you sharpen your skills, you can lower your starting vitality and power levels to make completion more difficult. The provision for only one life per game and lack of a save option makes Warlock a challenge; every time you "die" you begin again at the first screen. Perhaps the game's authors fear Warlock would otherwise be too easy. I look forward to vaporizing the wizard on level twelve and finding out if their fears are justified.



Searching for the Karna, you encounter help and hindrances.

Warlock
Three-Sixty Pacific
2105 S. Bascom Ave.
Suite 290
Campbell, CA 95008
408/879-9144
$34.95
Joystick required. ■

Continued from p. 16

CygnusEd Professional

The Amiga's repertory editor.

By Patrick Quaid

WHEN COMPARING TEXT editors, we tend to consider their advanced and esoteric features, even though the feel of the editor is ultimately more important. With CygnusEd Professional, you need not give up workability for features; the program excels in both areas. It is fast, clean, and precise. Text scrolls extremely quickly, searches and screen redraws are almost instantaneous, and even at the highest key-repeat speeds, the editor never, for example, continues scrolling after you let up the cursor key.

CygnusEd Professional also has just about all the options you could ask for. Search and replace, block commands, multiple windows, and all the other things we have come to expect from a good editor are included, but there is much more. The editor can cut and paste vertical and horizontal blocks of text, issue AmigaDOS commands, delete and undelete words and lines, and even print files. You can define macros for almost any combination of keys, and redefine keys, too.

Waltzing with Intuition

CygnusEd Professional's cohesive, efficient interface makes good use of Intuition, but doesn't rely on it. It runs from the Workbench and the CLI, and can create Workbench icons. The distribution disk includes a program called Ed, which, when you use it to invoke CygnusEd from the CLI, affords you additional options. For instance, Ed can make the CLI prompt return immediately or cause it to wait for CygnusEd Professional to complete its work. It can retain its link to the CLI so you can run DOS commands from the editor, or sever the link so the CLI window can close. The editor offers both menus and keyboard shortcuts, places requesters under your mouse pointer on screen, and can employ the mouse to scroll, mark blocks, and organize windows. String requesters retain their values, and the file requester remembers the directory it is working with; all requesters are keyboard controllable, too. The program multitasks elegantly: It can go dormant (so you don't have to exit), and be reawakened with a hot-key combination.

One of CygnusEd's most surprising aspects is its flexibility. You can specify mundane things like screen size and screen colors, whether the program uses its own screen or a Workbench window, and whether to display spaces, tabs, return marks, and escape codes. More interestingly, though, you can make decisions about the editor's fundamental operation. For example, you could make CygnusEd Professional work similar to AmigaDOS's ED by allowing the cursor to move anywhere on the screen and by having the program convert tabs into eight spaces. Reversing those decisions would make it work like the public-domain editor, MicroEmacs. You can design macros to work like either editor's command set (in fact, the distribution disk contains a set of macros that mimics MicroEmacs' control keys).

You can save these parameters—in different configurations for each type of file you edit—in environment files. When CygnusEd Professional first runs, it looks for an environment file to match the same suffix of the edit file you specify. If your command line is "ed filename.c," for instance, CygnusEd Professional will look for a configuration file called "CED-Defaults.c." The program also loads a default macro-definition file when it first runs, although apparently not with the same suffix feature.

Doing the Limbo Rock

CygnusEd Professional was designed with the programmer in mind. It handles multiple files and windows with great dexterity, has an auto-indentation key, supports markers in the file, and can even find matching parentheses and brackets. Because CygnusEd's multiple-window system works so effortlessly, I needed fewer hard copies of other files when using it to program.

All of CygnusEd Professional's features are accessible to external programs. The package supports William Hawes' ARexx interface language, and includes some ARexx example programs, including one for controlling CygnusEd from a C program. This remote-control function lets you integrate CygnusEd Professional with other programs; for instance, you could write a program to read a compiler-generated error file, then have the editor display errors and send the corrected file to the compiler.

While CygnusEd Professional is not a word processor, it has features that make it useful for writing things other than programs and batch files. It can wrap words at the right border and perform limited paragraph reformatting. ASDG (CygnusEd's publisher) has also included the text-formatting program Proff on the distribution disk, which helps make ungainly text files presentable. Like most good text editors, you can enter control and escape codes directly into the text for printer regulation.

ASDG supports CygnusEd on CompuServe, BIX, and UseNet bulletin-board systems, as well as by phone. The well-written manual consists of about 90 pages. The single, bootable, non copy-protected disk includes several example batch programs, and a utility for recovering files from memory after a Guru Meditation. CygnusEd Professional is probably all you want in a text editor. But while I rate it a perfect ten, MicroEmacs, which is included for free on the 1.2 and 1.3 Amiga Extras disks, is an eight or a nine. Still, CygnusEd is good enough to win you as a convert. If you demand the finest and can justify the expense, this is your editor.

CygnusEd Professional
CygnusSoft Software
Published by ASDG Inc.
925 Stewart St.
Madison, WI 53713
608/273-6585
$99.95
No special requirements.

Photon Video: Cel Animator

A time-saving, cost-cutting Prince Charming.

By Wayland Strickland

ONCE UPON A time, animation was created entirely by hand. Animators had to photograph each cell (drawing), edit ►

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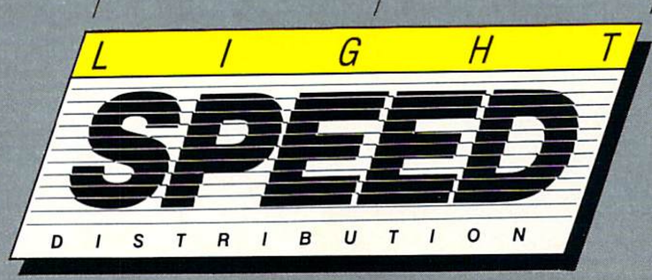
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the resulting film into a loop, and check for needed movement and timing changes. After making corrections, the animator had to repeat the entire process—starting with re-photographing the sequence—until the animation ran smoothly. This method required a great deal of time, patience, and money... alas, it seemed that high-quality animation was beyond the reach of all but big-name, money-backed studios. That is, until Cel Animator galloped in to save the day.

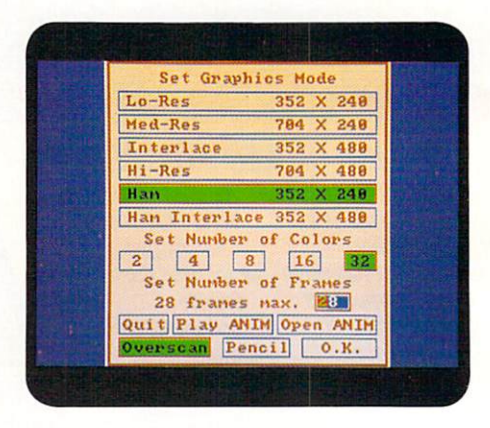
Cel Animator, from MicroIllusions' Photon Video series, cuts production time. It requires you to photograph (digitize) each picture only once (it also includes some paint-program-like features, so you can make minor corrections to cells without having to exit and load a dedicated paint package). Frames are stored in RAM and can be displayed in any order, at normal or slow speed. You can run your sequences backward as well as forward, and the program gives you complete control over cell delay times. You can add new cells to an existing animation at any point and repeat them any number of times, then store your creations on a floppy or hard disk. These and other features put it in a league well above simple page-flipping programs.

Cel Animator works with any graphics-creation program that saves in IFF or anim format; it can decompress anim files into IFF images, so you can alter frames individually. In my tests, files created with programs using early and special versions of the anim format—including those from Animate 3D (Byte by Byte), PageFlipper Plus F/X (Mindware International), and Video Effects 3D (InnoVision Technology)—would not load. Because such programs generally offer an IFF-save option, though, you can work around this fairly easily.

PITTER PATTER

Cel Animator further one-ups traditional animation methods with it's option for synchronizing video with sound. Using exposure sheets, you keep track of dialogue and sound effects, created by any audio-digitizing program, and match them to individual cells. The exposure sheets are separate text files that you can save as such or print.

While Cel Animator supports all Amiga screen resolutions—including HAM with overscan—the program has difficulty with screen sizes larger than 352×480 interlaced and 704×480 high resolution. Loading any such frames into Cel Animator produces a black screen display. For instance, all Aegis products use the broadcast FCC (Federal Communications Commission)-approved 384×480 interlaced and 768×480 hi-res overscan resolutions, so when you load one of these frames, Cel Animator displays a blank screen instead of the image. This is unfortunate, as it limits Cel Animator's



Choose your screen resolution here.

usefulness, especially in professional broadcast applications. It is also surprising, as MicroIllusions' Photon Video: Transport Controller, a companion program, does load such frames.

Once your animation is assembled satisfactorily, it is time to select from the several rendering methods available. The anim format provides an efficient way of replaying the piece. The best way to record the cells, however, is directly to videotape using a single-frame animation program (such as MicroIllusions' Transport Controller), which gives you access to a single-frame controller and an editing VTR (video tape recorder).

The manual, written by veteran animator Heidi Turnipseed, is comprehensive and very easy to understand. It assumes no prior knowledge of animation, and the tutorials help even neophytes produce great results. It is chock

full of professional hints and tips, and one section provides a quick reference to all the program's features.

Although Cel Animator requires just one megabyte to run, it can fully utilize up to eight megs. The program is not copy protected; you can transfer it to a hard disk. Cel Animator's interface is mouse-and-menu operable, and keyboard options are available for many functions. Despite its few limitations, this package is extraordinary. Its capabilities and simplistic approach put professional-quality animation within the reach of those who could not have considered it previously. I highly recommend Cel Animator to anyone involved or interested in animation.

Photon Video: Cel Animator
MicroIllusions
17408 Chatsworth St.
Granada Hills, CA 91344
818/360-3715
800/522-2041
$149.95
One megabyte required.

Microfiche Filer Plus

Vis-à-vis power.

By Loren Lovhaug

WITH THE MICROFICHE-film readers in libraries, you move a magnifying mechanism over a fiche (film containing reduced images of printed pages) to examine data. The Microfiche Filer Plus database manager works similarly. In the program's fiche window, miniature representations of all the records in your database are laid out in rows. You move the magnifier—via mouse—over the fiche. As you do, the magnifier enlarges the data in it's sight, displaying it in the magnification window. The presentation is impressive, as records scroll in and out of the magnification window quickly and fluidly.

What Can You See?

The effectiveness of this approach depends on the kind of information you need to organize and on how you use that data. It is ideal for frequent inspection of records in a small number of fields—for address-and-phone or price lists, and disk-catalogue databases, for example. Also, because of its visual nature, Microfiche Filer Plus is particularly well suited for applications wherein picture fields are crucial to the record-selection process. The program has excellent facilities for displaying IFF images of all types, including HAM, and enables you to create thumbnail images for inclusion in your display and print forms. If you must select records from many fields in a large database, however, or need to work in a complex relationship structure between fields, the visual metaphor is significantly less effective.

Microfiche Filer's heavy reliance on standard Intuition-style gadgetry makes the program easy to grasp, and Software Visions has done a wonderful job with keyboard support as well. All of the operations contained in the pull-down menus have logical keyboard equivalents, many of which are mnemonic. Additionally, several keyboard sequences aid in entering and editing text. By shifting the cursor keys you can jump to the beginning or the end of a line or field, and pressing the Tab key moves you forward a field while shifting it sends you back one.

There is just one area in which this support is lacking. Ideally, you should be able to size boxes via the keyboard on the basis of character height and width, particularly since Microfiche Filer Plus supports only the topaz font. The sizing of layout boxes, however, is entirely mouse- and gadget-controlled, as is the field-selection process. Nonetheless, Microfiche Filer Plus' form system is very flexible. With the form editor you can design multiple screen layouts, record-entry templates, and forms for printing to all Preferences-supported devices and to disk.

The program's report feature is probably inadequate for most people's report- ►

generation needs. In fact, it would be more accurately described as a total mechanism, as its only functions are to total numeric fields and count non-null items in each field.

Power Lifting

Microfiche Filer Plus is marketed not as a replacement for the original Microfiche Filer, but as an alternative for those with more sophisticated data-management needs.

The addition of a calculation-numeric field type in Microfiche Filer Plus addresses a weakness of its predecessor. You can enter simple arithmetic formulas in these fields, and set them up to perform calculations on other fields. This facility works fine. The inclusion of only simple arithmetic operators, however, severely limits the function's usefulness. Noticeably missing are date and date-calculation support, logical and financial operations, and statistical functions including the simple average, mean, and standard deviation.

Another feature that caters to power usage is programmability. Microfiche Filer Plus includes a port for the increasingly popular ARexx macro language. ARexx is an excellent choice for this application: It is very powerful, especially in terms of character and data manipulations, and is fast becoming a standard. Microfiche Filer Plus relies upon ARexx too much, however. By itself, the program is incapable of such common tasks as loading and saving record-selection criteria, batch updating records, executing relational searches, and exchanging data with other applications. To perform these operations using Microfiche Filer Plus, you must create ARexx programs. For some people—especially those who use ARexx for frequent inter-task communication—this might be preferable. But while ARexx is not a difficult language to learn, many people may find the prospect of ARexx programming intimidating. Indeed, the fact that Microfiche Filer Plus derives most of its sophistication from a text-based, non-intuitive programming environment is inconsistent with its visual metaphor.

Microfiche Filer Plus' approach is unique and perfectly suited to many applications, and its ARexx interface affords great power and flexibility. The lack of built-in menu-selectable sophistication and heavy dependence on ARexx's merits, however, are crippling.

Microfiche Filer Plus
Software Visions Inc.
PO Box 3319
Framingham, MA 01701
508/875-1238
800/527-7014
$179
No special requirements.

B.A.D.

Get down with AmigaDOS's funky floppies.

By W. Jeffrey Blume

DISK FRAGMENTATION IS a problem common to all disk-based personal computers. As a disk becomes filled, there frequently is no contiguous space in which to write a file, so the system must scatter blocks of data where it can find room. This fragmentation causes the drive head to travel across the disk numerous times as it reads a file, while the protesting drive emits the familiar gronking sound. The result? Input and output (I/O) are slowed significantly.

The B.A.D. (Blitz Amiga's Disk) optimizer utility from M.V. Micro analyzes disks, and organizes and rewrites them so that the header and data blocks of any given file immediately follow one another. The resulting decrease in disk-access times can be astounding.

Good for Bad

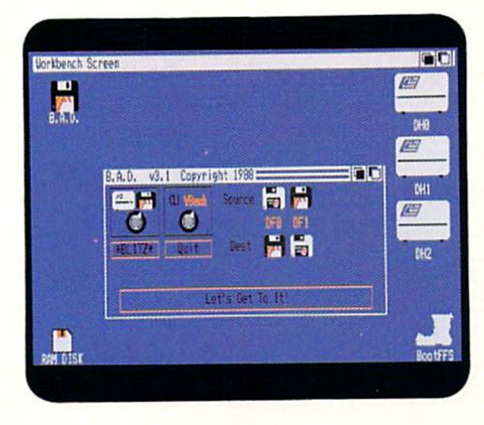
B.A.D. differs from disk-cacheing programs in that it does not use computer memory to attain its speed; thus, results are not lost if you remove the disk or reset the system. The drawback is that as you continue to use the optimized disk to store or modify data, its structure begins to fragment again, and eventually you may need to reprocess it.

When you load B.A.D., a small win-

dow opens to present its straightforward, entirely mouse-driven interface. One gadget toggles whether the program is to process a hard disk or a floppy, and another toggles between B.A.D.'s Workbench and CLI modes. Two more gadgets, Blitz and Quit, initiate processing and exit the program. Source and Dest (Destination) gadgets are displayed for each floppy drive attached to the system, while a single gadget is shown for each mounted hard-drive partition. At the bottom of the window, a string gadget reports the status of the disk being processed.

B.A.D. can read a source disk and write the optimized data to a second disk leaving the original unchanged. Alternatively, you can assign source and destination as the same drive. Processing with two drives requires at least 370K of free, contiguous RAM, so a 512K Amiga running in two-drive mode will not have enough memory to multitask. Because the single-drive mode requires only about 60K of memory, you might expect it to work on a 512K Amiga with one drive. I tested it on an A1000 with 512K and one drive and found that B.A.D. would not load under Kickstart 1.2. While the instructions do not specify a particular version of AmigaDOS, the program did load under 1.3. B.A.D. requires roughly 24K of RAM to process each meg of space on a hard-disk partition (470K of free contiguous RAM for an average 20-meg partition).

According to the on-disk documentation, B.A.D. will process a disk on a dual-drive system in two to five minutes, while it may take as long as 30 to 45 minutes with a single drive (depending on how full and how fragmented the disk is). In actual tests, B.A.D. turned in much better times—as fast as 19 minutes



Set yourself up for formatting.

for a 99-percent full disk on one drive.

B.A.D. processes hard-drive partitions in place. There is no partition-to-partition option, so for hard-drive and single-floppy processing, the documentation recommends that you back up the data first. Once the process has begun, you cannot abort it; if it is interrupted by a crash or reset, the target drive will be corrupted. Hard-drive processing can take 30–45 minutes for every 10 megs in a partition.

B.A.D. performs some optimizations designed specifically for AmigaDOS. Depending upon your preference for interfaces, B.A.D. will organize disks for best performance in either the Workbench or CLI environment. In the Workbench mode, it groups the .info files of each drawer together. Disk and drawer windows open dramatically faster: Prior to processing with B.A.D., a sample hard-drive window (with AmigaDOS v1.2) took over six seconds to display its contents; after processing it opened in about two seconds. Such results are common for floppies, too. While increases on FastFileSystem partitions are not as dramatic, the improvement is still quite noticeable.

Both Workbench and CLI modes give much faster directory access after processing; a typical DIR OPT A from the root of a floppy can take half the time. Because the Workbench mode yields almost as great a speed increase to CLI operations as the CLI mode *and* improves Workbench operations, it is the clear choice for users who work with both interfaces.

While it is true that you can achieve some of the benefits that B.A.D. affords using the AmigaDOS command COPY DF0: TO DF1: ALL QUIET, you do not get as many optimizations. The command accelerates Workbench only minimally, and it can take as long as 13 minutes, versus B.A.D.'s five minutes.

Should B.A.D. encounter difficulties ►

during processing it will report them in specific, helpful terms in an error file called RAM:BADMess and in the status string-gadget.

I experienced no problems running B.A.D. on an expanded Amiga in an intensive multitasking environment. As the program easily processed a disk in single-floppy mode, my text editor made saves to a hard drive and a second floppy, I plotted a hi-res interlaced Mandelbrot, and five other programs ran in the background. I also was able to multitask from one partition while B.A.D. processed another on the same unit.

M.V. Micro is a small company. My calls for technical support were often greeted by an answering machine, but I received return calls. I also found the company receptive to input. Unfortuately, the only documentation is an on-disk .doc file—about six printed pages. The program's operation is so straightforward, however, that the file is adequate. B.A.D. is not copy protected, and it gives Amiga disk I/O a great performance boost for a modest price.

B.A.D. version 3.1
M.V. Micro
PO Box 1112
Wheatridge, CO 80034-1112
303/467-1718
$39.95
No special requirements.

Draw 2000

We're getting close to home.

By Stephen Ellerin

ALTHOUGH IT IS billed as a totally-new program, Draw 2000 by Aegis appears to be a spiffed-up version of the company's earlier CAD (Computer-Aided Design) program, Draw Plus.

The package comes with three disks: the regular program disk, an alternate which promises a further 50% increase in speed for those who have a 68020 with a 68881 math coprocessor, and one containing libraries of electronic, electrical, plumbing, floor plan, and furniture parts.

When the Chips are Down

Draw 2000 runs with 512K, but Aegis recommends a megabyte of memory or more. No matter how much RAM you have, however, expect to be constrained by chip-memory limitations. I found it impossible to open more than two windows in the interlaced, high-resolution mode. Even then, unless my second window matched the proportions of the main one, most requesters would not open (commands that don't require requesters work fine). To overcome this, Draw 2000 introduces a medium resolution, at some sacrifice in detail, and a four-color Workbench mode (which increases both screen-redraw speed and the number of windows you can open), at a greater sacrifice.

As you work, you can shift into Workbench mode for memory-intensive operations and back to a higher resolution for more detail. Although I couldn't get Draw 2000 to shift directly from hi-res to medium, it would shift from high, to low, to medium. (Some of the 16 colors in the higher resolutions may be transposed to blue in Workbench mode and thus will not show up against the lo-res background.) All windows accepted a grid of one inch square—the smallest I tried.

You can start using Draw 2000 right out of the box, but the documentation gives you an edge. The spiral-bound manual begins with the basics, and a genuine tutorial takes you step-by-step through designing a floor plan as it introduces you to most tools. Commands are described in the order they appear in the menus, and each explanation includes how-to instructions. Some descriptions, however, are not as clear as they should be. Also, instead of explaining every aspect as it is mentioned, the manual often refers you to another chapter for a fuller description. This is distracting; a compromise would be to summarize the procedure.

Easy Does It

Draw 2000 is the easiest-to-use CAD system I know of. You can draw freehand or use previously-created parts—shapes that you have grouped into objects. The first group of tools draws lines, rectangles, polygons of any shape, arcs, circles, ellipses, text, and dimension (measurement) lines. To retrieve a tool, simply select it from the Tools menu or press the appropriate function key. You can create many of the objects from the keyboard, by positioning the cursor at the intended origin, touching the Escape key, and entering numeric values.

With the second category of tools, you can drag, clone, erase, or re-size any object, change its color, or grab a hook to change its shape. You can also rotate the object around any axis, and, with the powerful Stats command, change the height, width, angle, and starting coordinates.

The Group commands let you undo your last action, and cut, paste, or erase objects contained in a marked window. You can modify the pattern, weight, and color of the line, change the size, proportions and angle of all objects in the window, create a new part, mirror things in eight directions, and create an array. Numeric Edit is the most powerful command: It accurately changes height, width, angle, and so on to the values you enter from the keyboard.

While most tools remain in effect until you choose another, you must select Group commands from the menu each time you need them. Ironically, these functions often require several tries to box precisely. Only half of these commands have keyboard equivalents, and of those, one does not respond.

The Display menu controls what you see. You can toggle Grid, Ruler, and screen-wide cross hairs, open as many windows as memory permits, zoom in or out, alter colors, and select layers for display. Other menus let you change grid size and pattern, units (decimal, feet, or metric), drawing size, and font size. You can toggle the Grid Snap (when it's on, any click on the screen snaps to the nearest intersection of grid coordinates), and whether to fill objects with one of eight patterns. The Smoothing option rounds any object, and the Help button summons a Fast menu.

While the options are many, their placement in the menus seems haphazard, which makes them inefficient to use.

Safe on First

Draw 2000 allows you to save any number of color palettes. You can save an entire drawing or any window as an IFF file, and a new option lets you save in a format compatible with Aegis' Modeler 3D.

You can also save settings, but while ►

Circle 194 on Reader Service card.

chip-memory shortage complicates this on one hand, the same factor makes it almost essential on the other. All screens default to a five-foot square grid (you can select feet, meters, or absolute values), and because the main screen accepts a grid no smaller than one foot square (without zooming), you must open a second screen to work in detail. In hi-res, however, the program often consumes so much memory that it cannot display the requester that lets you alter grid size. Fortunately, by selecting Quit, you can get to a requester that lets you save settings; reentering the program then causes your second screen, if no wider than 21 feet in scale, to default to a one-inch square grid.

Draw 2000 supports all Preferences printers, but to accommodate a large drawing, you must divide it into sections, print one $8^1/_2 \times 11$-inch sheet at a time, and tape them together.

Because plotting a full-size drawing can take up to an hour, Aegis designed their plot method to allow multitasking. You save your drawing as a plot file, which the program then sends to your plotter while you continue working. Unfortunately, the program will only save plots to the Draw 2000 disk, which is too full to accept a drawing.

An Aegis technical representative offered two alternatives. You can select Save As from the Project menu and Plot from the submenu, then give the file a unique name, and send it to your plotter from the CLI. The second option gets the rendering function to work but does not enable you to multitask. It involves selecting Save As and Plot as above, and then typing ser: (or par:, if your plotter connects at the parallel port).

SPLISH-SPLASH

Given the investment Aegis has made in this product, I find it puzzling that they have not polished it. Draw 2000's heaviest millstone is the program's insistence on drawing all your on-screen corrections twice. This nuisance becomes infuriating when the redraw involves or borders text (the program renders text very slowly), or when the Undo command redraws the entire screen. The fact that most commands act, by default, on the objects you drew first—even after you change the active layer—is illogical, and although you can easily set your drawing to a scale of one-quarter or one-half via the Format command, you cannot plot a three-quarter or three-eighth scale from within the program.

Among the things I would like to see added to the program are a Spline command and a Change Layer command that could reassign the layer of all items within a boxed area.

Draw 2000's operating speed is minimally acceptable by professional standards. The program's design flexibility is excellent: You can move, duplicate, alter, and make corrections easily, and lay out your project quickly. This is the only professional CAD program I have seen with a true Amiga interface. Draw 2000 is not perfect, but it is the best Amiga CAD program I know of.

Draw 2000
Aegis Development
2210 Wilshire Blvd.
Suite 277
Santa Monica, CA 90403
213/392-9972
$279.95
No special requirements. ►

ProScript

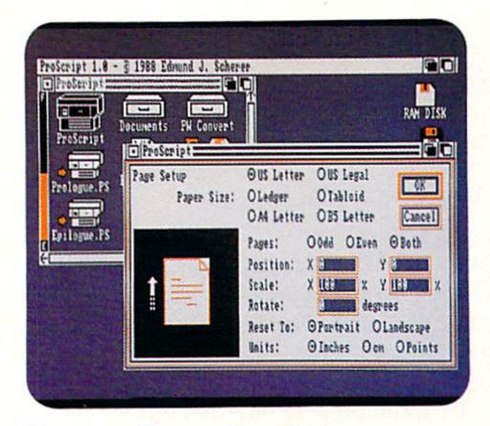
A step in the right direction.

By Chris Dickman

WHILE NEW HORIZONS Software designed ProScript primarily to add PostScript-printer support to the firm's ProWrite word processor, ProScript's file-conversion abilities afford PostScript access to Scribble! (Micro-Systems Software), TextPro (Abacus), and Textcraft (Commodore) owners, too.

Two to Tango

ProScript provides two ways to access the fonts in a PostScript printer. The most primitive is to compose your document using the skimpy, bitmap Amiga-system fonts. You then set up a font-substitution list which, at print time, replaces a PostScript font with the Amiga font. A problem with this approach is that text displayed on the screen only roughly corresponds to what emerges from your printer, because the substituted fonts have different character widths. If you are printing files converted from Scribble!, TextPro, or Textcraft, however, this is your only option (unless you want the document to print in Topaz). Your converted files will thus print in only one PostScript font; there is no way to mix typefaces or type sizes within these documents.



You can position, scale, and rotate pages.

ProWrite users have access to more, but by no means all, of the power and flexibility of PostScript printers. To display type on the screen that corresponds accurately to what will appear on a PostScript-printed page, an application program must have access to font metrics files, which contain information on font widths, and screen fonts, which display the fonts on the screen. ProScript has these sets for Helvetica, Times Roman, Courier, and Symbol fonts. Because the program lacks such files for the remaining fonts resident in PostScript printers, however, you must resort to the primitive font-substitution technique to use them. To New Horizons' shame, nowhere on the package is this limitation pointed out. The documentation sheepishly mentions that the many screen font and metrics files supplied with Gold Disk's Professional Page work with ProScript—which is dandy if you happen to use that program. Otherwise, tough bananas.

Once the metrics and screen font files are installed, you simply use ProWrite to select text in your document, and choose the desired font from a menu. The screen fonts look a bit clunky at medium resolution, but at hi-res they are quite respectable. While you can convert documents produced with the other three compatible word processors to ProWrite format, then open the files under Pro- ►

Write and assign fonts, I question the usefulness of this option. After all, how many people own ProWrite *plus* Scribble!, TextPro, or Textcraft?

Pliant Printing

ProScript must be running in order for you to print to a PostScript device. Thankfully, the program multitasks nicely, allowing you to edit documents while printing. Through requesters, you can set a range of print options. The General Setup requester allows you to specify between 2 and 256 shades of gray when converting color images to the black-and-white world of laser printing (although ProWrite 2.0 only supports 16). A related capability lets you establish the halftone screen density and the number of halftone cells per inch—both help control how PostScript renders your bitmap images. Page Setup lets you switch between portrait and landscape modes, as well as scale, rotate, and position your page. ProScript also lets you save documents to disk as ASCII PostScript files, which can be output by a service bureau with either a garden-variety laser printer or a high-resolution device.

ProScript is useful but limited. With improved access to resident fonts and a more comprehensive approach to the conversion of other word-processing formats, I would praise ProScript. As is, the program does not meet current PostScript-support standards.

ProScript
New Horizons Software
PO Box 43167
Austin, TX 78745
512/328-6650
$49.95
No special requirements.

DeluxePrint II

See the signs and believe.

By Morton A. Kevelson

DELUXEPRINT II LETS you print specialized documents such as signs, banners, and cards faster and easier than general-purpose paint and desktop-publishing programs.

Its Intuition-style interface makes DeluxePrint II easy to use. On the working screen you see a color palette on the left, a miniature version of your project in the center, and control gadgets on the right. The Preview function lets you view your project up close; you can even adjust the magnification.

Seven formats accommodate your creations. Banners print sideways; they can be up to $8\frac{1}{2} \times 22$ inches. The greeting-card format prints quadrants on a sheet—two upside down (you then fold the sheet in half twice). You can make labels up to $4\frac{1}{4} \times 1\frac{7}{8}$ inches, and resize this format to print in standard business-card size. Signs can be laid out as full pages or in four sections per page. Letterhead format fits your design into the upper third of a page, and finally, you can print a one-month calendar to fill a sheet.

Laying It on Thick

All formats are assembled from four elements: a background (any IFF image), icons (44 × 52-pixel brushes), borders, and text. DeluxePrint II comes with a disk of prepared backgrounds, borders, and icons (unfortunately the manual does not show printouts of them) that you can modify. You can also create your own graphics (the program contains enough drawing tools to handle simple tasks), or import them.

Each element has a designated priority (layer), and except for borders, the components can be manipulated and positioned independently. Priorities determine how elements will be superimposed on one another; when overlap occurs, the higher-priority item prints on top of the other. The background constitutes the bottom layer, upon which everything else is placed.

The center layer accommodates up to nine different icons (graphic images), and as many copies of them as you please. You can even snip out parts of the background to use as icons. Icons are prioritized, too, based on the order in which they are placed; this order is maintained when images are repositioned. ►

The top layer consists of text; you add lines of up to 80 characters one at a time, positioning and modifying them individually.

Borders are separate entities—you cannot lay a border over or under another component. All are one inch wide, and although they are immobile, you can flip the left and bottom segments.

Now Join In

The program disk contains a variety of fonts, some very attractive. You can also import font files, but the method for doing so is awkward: You must go through the CLI—*before* accessing DeluxePrint's font menu. Once you have loaded the program fonts, you are stuck with them until you restart. Text styles include bold, italic, underline, box, background, and shadow; you can control inter-character spacing, too. To mix styles on a line, simply place sections side by side. You can change all text characteristics, including the letters themselves, after placement.

Icons are stored to disk in groups of nine. Although all the icons in a set appear on screen when you select one from the group, the computer retrieves each one from the disk individually. Once loaded, however, the icon remains in memory for future access.

When you save a project in DeluxePrint II format, the elements remain intact so you can manipulate individual components at a later time. You can save in IFF format, too, but here the elements lose their independence.

You will find one annoying quirk in the program when you call up a file; DeluxePrint II insists on looking in df0: the first time it attempts to load; you cannot choose another drive until it has gronked through the entire directory. Once a directory is in memory, however, the program recalls it for the next load.

To see your project in hard copy, you simply set the size of the printout by inches in decimal fractions and select vertical or horizontal orientation. For most applications, the program can determine page width from the printer driver and calculate the length automatically. When printing a four-tile sign or a greeting card, however, you must specify the spacing between the panels.

The well-written manual includes a thorough index. The introductory chapters are followed by sample projects for each format. An extensive reference section details all functions.

I am puzzled as to why Electronic Arts released DeluxePrint II *after* Commodore officially released version 1.3 of the operating system. As it is, the program works only with AmigaDOS 1.2! If you



Text has top priority—it prints over icons.

have configured your system for 1.3, then, you must give it up to run DeluxePrint II. The Electronic Arts representative I spoke with said he did not know when or if an update would be released to address the deficiency.

I tested the program using a Star Micronics NX-1000 Rainbow printer with the Epson JX-80 driver, and got good results. I was unsuccessful, however, in printing with my Canon PJ-1080A. I tried four drivers, but was not really surprised that none worked; Commodore specifically supports the 1080A only under AmigaDOS 1.3.

DeluxePrint II is the best program of its kind I know of, and it's leagues ahead of the original DeluxePrint. If the AmigaDOS restriction does not bother you, you will be happy with the package.

DeluxePrint II
Electronic Arts
1820 Gateway Dr.
San Mateo, CA 94404
415/571-7171
$79.95
No special requirements. ■

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Quadralien presents a double mission. You must prevent the meltdown of Astra, the cybernetic nuclear fission complex, and destroy the evil Quadralien forces that have entered the complex. To advance through the levels, you must choose droids to fight for you. Each is equipped with strong and weak points. You must plan the use of the droid, maintain it, and keep up a fast pace to succeed. Developed by Logotron Ltd., both Starray and Quadralien retail at $39.95 and are distributed by Spinnaker Entertainment Group, 1 Kendall Square, Cambridge, MA 02139, 617/494-1200.

DEATH AND TAXES

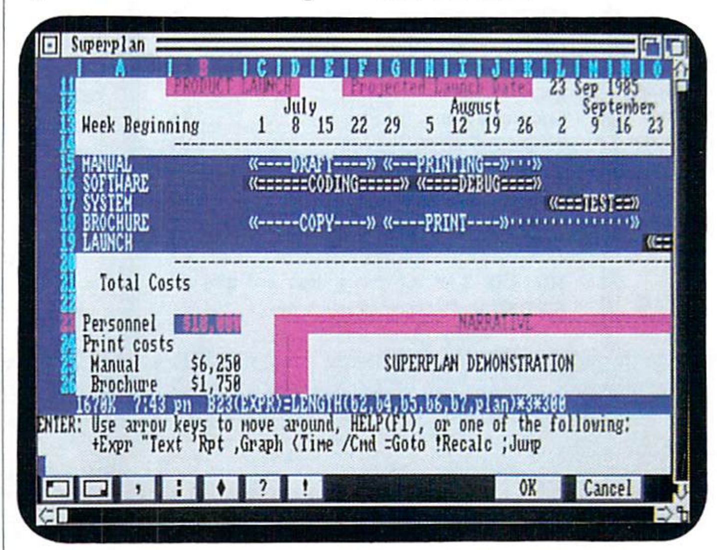
THE NEXT BEST thing to not paying is having help. **Tax Break**, a tax preparation package, includes form 1040, schedules A-E, R, SE and IRA calculations. The software prints IRS-approved tax-form fascimiles. Tax Break/1040 costs $74.95 and is available from Datamax Research, Box 5000, R4, Bradford, Canada L3Z 2A6.

HIT THE STREETS

FIGHT HAND TO hand and foot to head in **Operation: Clean Streets**. You have been assigned the mission of cleaning up the city as Cleanup Harry, an undercover cop with a reputation. Retailing for $39.95, this game features 3-D animation and five levels of fighting. Get the dirt from Broderbund Software Inc., 17 Paul Dr., San Francisco, CA 94103-2101, 415/492-3500.

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WHAT HAS A 74-function spreadsheet, project management software and business graphics all rolled into one? **Superplan** from Precision. Superplan comes with a macro language that lets you tailor your work environment. The program allows project management activities including critical path analysis, time/expense planning, resource allocation, gantt and PERT charts. The program supports ARexx, so you can exchange data with other programs. For pricing and more information, contact Precision Inc., 8404 Sterling St., Suite A, Irving, TX 75063, 214/929-4888.



Forecast project costs over time.

DREAM WEAVER

EVADE BONZO THE Bouncer, outsmart the Informer Pig, appease the Oriental Princess or win the Emperor's favor in the **Dream Zone** from Baudville. In this graphics-adventure game, a mad scientist has turned your dreams into reality. By using logic, imagination, peristence, and a sense of humor, you overcome the source of your nightmares. The Dream Zone is available for $49.95 from Baudville, 5380 52nd Street, SE, Grand Rapids, MI 49508, 616/896-0888.

HI HO SILVER!

ENHANCE YOUR system's graphics capabilites with **Fancy 3D Fonts — Turbo Silver Version**, a two-disk set of three proportionally-sized fonts. The fonts are Called Bold, Ital, and Fanc and emulate the font sets traditionally known as Helvetica Bold, Bookman Italic, and Clarendon Medium. Each font set includes upper and lower case, numbers, symbols and many international characters. The fonts retail for $79.95. Contact Access Technologies, PO Box 202197, Austin, TX 78720, 512/343-9564. ►

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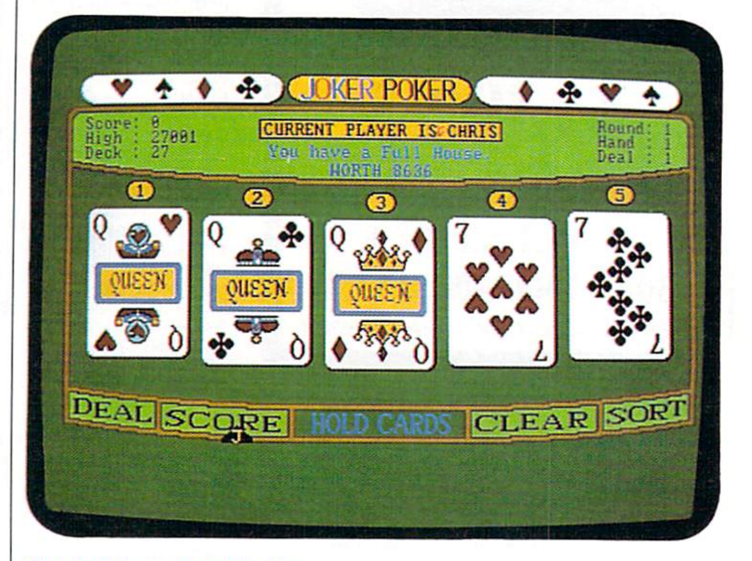




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Cut the Cards, Mate

YOU AND 90 of your closest friends can play **Aussie Joker Poker**, an Australian poker game. You can select the number of hands per player and the deck size. The program gives you automatic rotation of player order, game status updated to disk, and a password-controlled gambling system. For $49.95 the games comes with printed and on-screen rules and instructions. A Joker Poker contest will run through April 1989. The top 20 finalists will receive a round-trip ticket to Las Vegas and a chance to win $100,000. Aussie Joker Poker is distributed by Mindscape, Inc., 3444 Dundee Road, Northbrook, IL 60062, 312/480-7667.



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AN OUTLINE PROCESSOR, **Thinker** lets you expand outlines into complete documents. You can use the program as a writing tool, a planning tool, or a database. All record formats are flexible and can link to other documents, pictures, or Workbench applications. You can use Thinker to create simple outlines, for word processing, planning books, writing documentation, organizing pictures, on-line documentation, or program design. Thinker is available for $79, but you can get $20 off until April. For more information, contact Poor Person Software, 3721 Starr King Circle, Palo Alto, CA 94306, 415/493-7234.

The South Will Rise Again

RETURN TO September, 1863 with **Rebel Charge at Chickamauga**, the latest Civil War simulation from Strategic Simulations. All units are brigade size and may be broken down into demi-brigades, then built up again. You can represent either the Union or the Confederate army and choose the computer or a friend as an opponent. Join the fight for $59.95. For more information, contact Strategic Simulations, 1046 N. Rengstorff Ave., Mountain View, CA 94043, 415/964-1353.

A Database for All Seasons

PRECISION HAS UPGRADED its Superbase series. **Superbase Professional 3** ($349.95) includes telecommunications facilities, a new forms editor, and cross-file validation and lookup. Security-key copy protection has also been lifted for registered users. You can now transfer data to and from other computers running Superbase.

A scaled-down version of the professional model, **Superbase Personal 2** ($149.95) includes a text editor, mail-merge facility, browse controls, relational data entry, and the ability to link and retrieve external text, graphic and sound files.

Superbase Personal 2 sells for $149.95. Registered users of Superbase Professional and Personal should contact Precision Incorporated, 8404 Sterling St., Suite A, Irving, TX 75063, 214/929-4888 for upgrade information.

Modern Michelangelo

PICK UP YOUR brush with **DeluxePaint III**, Electronic Arts' latest version of its popular paint program, offering integrated paint and animation capabilities. For $149, the stepped-up program includes Extra_Halfbrite support, direct overscan painting, improved font support and an airbrush feature. Contact Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404, 415/571-7171.

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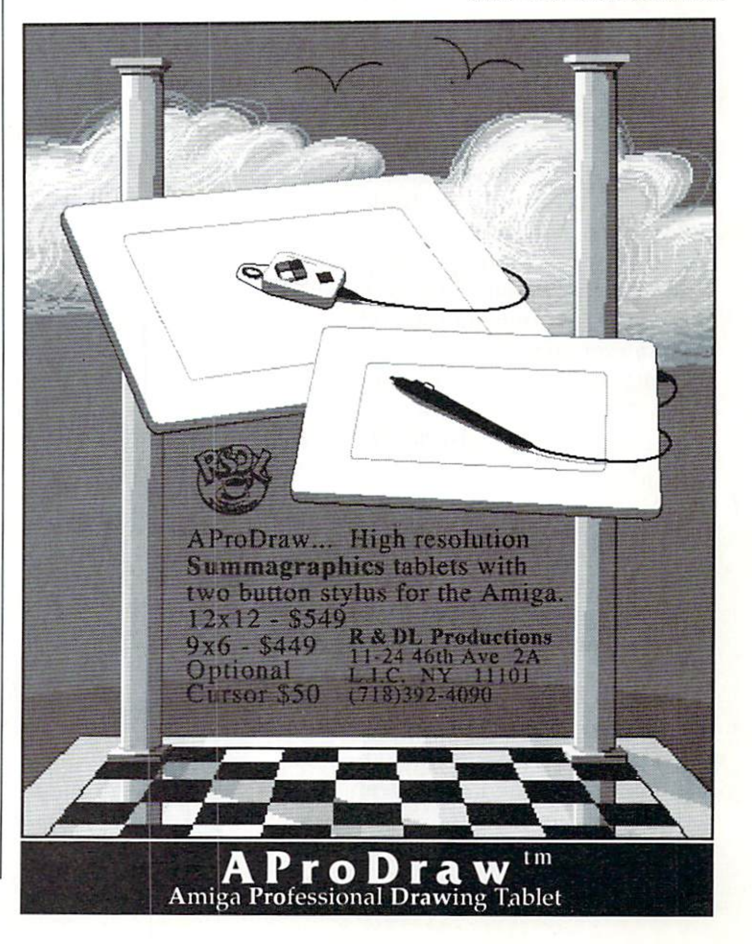
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HORS D'OEUVRES

Hints, tips, and techniques

from your fellow Amiga users.

Empty File Deletion

IF YOU HAVE ever gotten stuck with an Empty file, which usually results from an unsuccessful attempt to download a file from a bulletin board, then you know how frustrating it can be to delete one. After accumulating many Empty files on my disks, I finally found a way to delete them. Using ED, create a new file in RAM with the same name as the Empty file you wish to delete. Then simply copy the new file over the old one and delete it. There, now it's gone!

Brian Ecton
Garland, TX

Aaargh!

IN THE ROLE-PLAYING arcade game Aaargh!, after you destroy the first city and find the egg, the surefire way to destroy your adversary in the battle for the egg is to just start punching. Stand still (do not move forward), put the joystick in the punch position and keep it there. Let the monster come to you and you will win every time. If instead you try to get fancy, the monster will win every time.

Michael J. Cervetti
Cordova, TN

DPaint Smoothing

HERE'S A HINT for those who use DeluxePaint II and its powerful special effects. If you want to smooth a part of the picture you are editing, select it as a brush; then, enter the perspective mode by pressing the keypad Enter key, specify the anti-aliasing (smoothing) level you wish to use from the Effects menu, and click the left mouse button. This method has two advantages: First, you can choose the smoothing level you wish to use; and second, you can even rotate or move the results.

Alex Bienchisii
Rome, Italy

BASIC Color Fades

HAVE YOU EVER wondered how professional programmers make colors fade on and off between screens and thought that it would be neat to use this effect in your own programs? It's easy using Amiga Basic. I use the PALETTE statement to create my screen colors. To start with, I use a black background and fade the colors on. Here is an example:

```
FADE.ON.:
  FOR I=0 TO 1 STEP .02
  PALETTE 0,0,0,0
  PALETTE 1,I,I,I
  PALETTE 2,I,0,0
  PALETTE 3,0,0,I
  NEXT I
```

Using this in a GOSUB routine will save you time and memory; just add a RETURN statement after the NEXT I statement. This simple loop demonstrates the colors fading on from black to white, red, and blue. The loop could be made more complex to accommodate different colors.

To fade the colors off, all you have to do is reverse the FOR statement:

```
FADE.OFF.:
  FOR I=1 TO 0 STEP -.02
  PALETTE 0,0,0,0
  PALETTE 1,I,I,I
  PALETTE 2,I,0,0
  PALETTE 3,0,0,I
  NEXT I
```

Using this simple GOSUB routine makes your programs look professional, and it is a great way to show off your Amiga Basic programming skills.

Richard Hyatt
Richmond Hill, Ontario

SAY Proofreader

GENERALLY CONSIDERED AN interesting but slightly frivolous feature, the Amiga's built-in speech capability is as useful as the stodgiest spreadsheet to anyone who must enter a lot of text or numeric data accurately from the keyboard.

The AmigaDOS SAY command lets you proof your work quickly and easily against a printed source without having to glance constantly back and forth between the source and the screen.

To do this, save the work to a disk file (we'll call it POWER.DATA here), exit your word processor or spreadsheet, and call up a CLI. Make sure POWER.DATA is in the current directory. At the prompt, type:

```
SAY -X POWER.DATA
```

(Note the space between SAY and -X.) The pronunciation may be slightly Martian, but the voice is clear enough to catch any and all mistakes in a long table of numbers, and most mistakes in text. Formatting codes from a word processor may cause error messages on the screen, which you can ignore. To bail out once the Amiga has started talking, press CTRL-C.

Bob Keefer
Creswell, OR

If you have an idea you'd like to share with our readers, send it to Hors d'oeuvres, AmigaWorld *Editorial, 80 Elm St., Peterborough, NH 03458. If your idea gets published, you'll receive an* AmigaWorld *surprise gift.* ■

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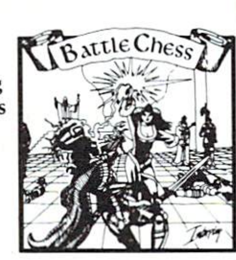
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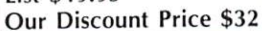
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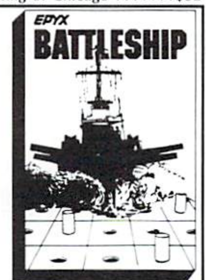


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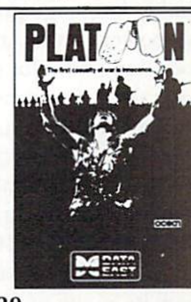


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HELP KEY

Load-and-Run compiled this column to link up with your problems, so you can execute the solutions.

By Louis R. Wallace

Native Tongue

Q: *I want to convert Amiga Basic to the Amiga's faster native language. Would that be machine language? What would I need?*

J.S. Chastain
Cleveland, GA

A: The simplest way to convert Amiga Basic to machine language is by using an Amiga Basic compiler, such as the Absoft A/C Basic Compiler. This programmer's tool will take an Amiga Basic source file and convert it to executable machine language. While the resulting program will run at least five times faster, it will not perform as well as a program originally written in 68000 assembly language.

If you want the fastest possible program, then you should write your program in assembly language directly with an assembly language development tool, such as C.A.P.E. 68K (Inovatronics Inc.). Assembly language gives you the full power of the Amiga, but it does demand a lot of development time. Operations you can perform in a single Amiga Basic command require pages and pages of assembly code.

If your only language experience is with BASIC, you might want to make an intermediate move to C or Modula-2 before making the transition to assembly language. These languages are much easier to master than assembly and are almost as fast.

IBM Transformations

Q: *Will any 3½-inch-format IBM software run on an Amiga 500? If so, how can I tell which programs will work?*

G. Nesbit
Collinsville, IL

A: You cannot run the software straight out of the box. You can, however, use Commodore's Transformer, a program that lets you run a very limited selection of IBM software. You can run only text-based programs, as the Transformer does not support graphics.

Library Redirection

Q: *Can I use a LIBRARY routine from Amiga Basic to send the output from the FILES command to the printer instead of the screen?*

S. Young
Appleton, WI

A: I know of no routine that will redirect the Amiga Basic FILES command. You can write a subprogram, however, that will use a LIBRARY routine to create a new Amiga Basic command that provides a directory. The example command below, called CLI, will give you a directory listing and store it in a temporary file in RAM:. You can direct the file to the screen or a printer. (With extra work, you could turn the routine into a general CLI command parser.) ■

```
' redirect output to a
' file in RAM:
DECLARE FUNCTION Execute& LIBRARY
DIM f$(1000) ' max # of file entries
counter=0
command$="list" ' or use dir
CLI (command$) ' the new command
OPEN "ram:temp" FOR INPUT AS #1
WHILE NOT EOF(1)
   LINE INPUT#1,f$(counter)
   counter=counter+1
   IF counter=1001 THEN counter=1000
WEND
counter=counter-1
IF counter<1 THEN
   PRINT "Nothing found!"
   GOTO MyExit
ENDIF
COLOR 2,0
PRINT f$(0)
LPRINT f$(0)
FOR i=1 TO counter-1
   a$=MID$(f$(i),30,3)
   COLOR 1,0
   IF a$="Dir" THEN COLOR 3,0
   PRINT f$(i)
   LPRINT f$(i)
NEXT
COLOR 2,0
PRINT f$(counter)
LPRINT f$(counter)
COLOR 1,0

MyExit:
   END

' subprogram functions as
' the new command: CLI
SUB CLI (command$) STATIC
   LIBRARY "dos.library"
   command$=command$+" > ram:temp"
   x=Execute&(SADD(command$+CHR$(0)),0,0)
   LIBRARY CLOSE
END SUB
```

The Pull-Down Menu

The Pull-Down Menu

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January 1989—An Amiga starter kit: hardware and software recommendations for building your first system. Programming graphics in C. Index to 1988 articles.

December 1988—Software Buyer's Guide. Programming Superbase Professional. Graphics tips on airbrush painting. AmigaDOS 1.3 overview, part 5.

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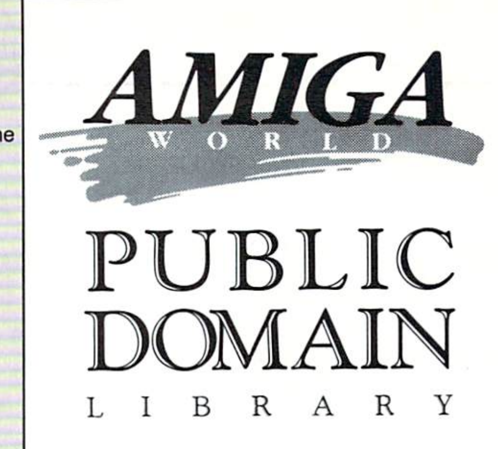
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This month's selections

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#SE 118 - Games, Missile Command, 3-D, Triclops, Cosmo-asterolds clone, BreakOut, Yatzee, Hack, more.
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#SE 134 - Applications I. Label maker/printer, grocery-list maker, disk cataloger, star viewer (planetarium), more.

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- ☐ 2. Very Good
- ☐ 3. Pretty Good
- ☐ 4. Good
- ☐ 5. Fair
- ☐ 6. Poor
- ☐ 7. Very Poor
- ☐ 8. Terrible

B. What will be your next major peripheral purchase?
- ☐ 1. Monitor
- ☐ 2. Dot matrix printer
- ☐ 3. Modem
- ☐ 4. Memory Expansion
- ☐ 5. 3.5" Floppy Drive
- ☐ 6. Hard disk drive
- ☐ 7. Gen Lock or Frame Grabber
- ☐ 8. Music (Midi, Keyboard, etc.)
- ☐ 9. Color printer
- ☐ 10. Laser printer

C. Check all of the endings that best complete this sentence: "Most of AmigaWorld is . . ."
- ☐ 1. Just Right
- ☐ 2. Too Simple
- ☐ 3. Too Complex
- ☐ 4. Fluff
- ☐ 5. Useful
- ☐ 6. Useless
- ☐ 7. Interesting
- ☐ 8. Biased
- ☐ 9. Invaluable

D. What topics would you like to see covered in future issues of AmigaWorld? (Please pick three.)
- ☐ 1. C Language
- ☐ 2. Amiga Basic
- ☐ 3. CLI
- ☐ 4. Telecommunications
- ☐ 5. Business Applications
- ☐ 6. IBM compatibility
- ☐ 7. Home Applications
- ☐ 8. Education
- ☐ 9. Video
- ☐ 10. Science and Engineering
- ☐ 11. Rumors
- ☐ 12. Buyer's Guides
- ☐ 13. Comparative Reviews
- ☐ 14. Music
- ☐ 15. Graphics
- ☐ 16. Program Listings
- ☐ 17. New Products
- ☐ 18. Opinions
- ☐ 19. Hardware Projects
- ☐ 20. Other

E. What are your favorite things about AmigaWorld? (Please pick all that apply.)
- ☐ 1. Zeitgeist (Editor's Page)
- ☐ 2. Repartee (Letters)
- ☐ 3. Reviews
- ☐ 4. Notepad (industry news)
- ☐ 5. Help Key (questions)
- ☐ 6. Features
- ☐ 7. Tutorials
- ☐ 8. Hors d'oeuvres (hints/tips)
- ☐ 9. Advertisements
- ☐ 10. Digital Canvas
- ☐ 11. Articles

F. Which of the following categories do you plan to purchase software from in the next 12 months?
- ☐ 1. Entertainment
- ☐ 2. Word Processing
- ☐ 3. Communications
- ☐ 4. Spreadsheets
- ☐ 5. Home Productivity
- ☐ 6. Programming
- ☐ 7. Software Development
- ☐ 8. Video
- ☐ 9. Database Management
- ☐ 10. Financial Management
- ☐ 11. Graphics
- ☐ 12. Education
- ☐ 13. Music
- ☐ 14. Animation
- ☐ 15. Sound/Speech Development
- ☐ 16. CAD/CAM

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- ☐ 1. I subscribe
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H. Where do you buy your computer products? (Please pick one.)
- ☐ 1. Computer Dealer
- ☐ 2. Mail Order
- ☐ 3. Manufacturer
- ☐ 4. Discount/Department Store
- ☐ 5. Other ____________

I. Do you own an Amiga?
- ☐ 1. Yes
- ☐ 2. No

J. Where do you use your Amiga?
- ☐ 1. Home
- ☐ 2. Work
- ☐ 3. School
- ☐ 4. At home for business
- ☐ 5. Both at home and work
- ☐ 6. Both at home and school
- ☐ 7. I don't use an Amiga

K. Is this your copy of AmigaWorld?
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153	158	163	168	173	353	358	363	368	373	553	558	563	568	573
154	159	164	169	174	354	359	364	369	374	554	559	564	569	574
155	160	165	170	175	355	360	365	370	375	555	560	565	570	575
176	181	186	191	196	376	381	386	391	396	576	581	586	591	596
177	182	187	192	197	377	382	387	392	397	577	582	587	592	597
178	183	188	193	198	378	383	388	393	398	578	583	588	593	598
179	184	189	194	199	379	384	389	394	399	579	584	589	594	599
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A. How would you rate this issue of AmigaWorld? (pick one)
- ☐ 1. GREAT!
- ☐ 2. Very Good
- ☐ 3. Pretty Good
- ☐ 4. Good
- ☐ 5. Fair
- ☐ 6. Poor
- ☐ 7. Very Poor
- ☐ 8. Terrible

B. What will be your next major peripheral purchase?
- ☐ 1. Monitor
- ☐ 2. Dot matrix printer
- ☐ 3. Modem
- ☐ 4. Memory Expansion
- ☐ 5. 3.5" Floppy Drive
- ☐ 6. Hard disk drive
- ☐ 7. Gen Lock or Frame Grabber
- ☐ 8. Music (Midi, Keyboard, etc.)
- ☐ 9. Color printer
- ☐ 10. Laser printer

C. Check all of the endings that best complete this sentence: "Most of AmigaWorld is . . ."
- ☐ 1. Just Right
- ☐ 2. Too Simple
- ☐ 3. Too Complex
- ☐ 4. Fluff
- ☐ 5. Useful
- ☐ 6. Useless
- ☐ 7. Interesting
- ☐ 8. Biased
- ☐ 9. Invaluable

D. What topics would you like to see covered in future issues of AmigaWorld? (Please pick three.)
- ☐ 1. C Language
- ☐ 2. Amiga Basic
- ☐ 3. CLI
- ☐ 4. Telecommunications
- ☐ 5. Business Applications
- ☐ 6. IBM compatibility
- ☐ 7. Home Applications
- ☐ 8. Education
- ☐ 9. Video
- ☐ 10. Science and Engineering
- ☐ 11. Rumors
- ☐ 12. Buyer's Guides
- ☐ 13. Comparative Reviews
- ☐ 14. Music
- ☐ 15. Graphics
- ☐ 16. Program Listings
- ☐ 17. New Products
- ☐ 18. Opinions
- ☐ 19. Hardware Projects
- ☐ 20. Other

E. What are your favorite things about AmigaWorld? (Please pick all that apply.)
- ☐ 1. Zeitgeist (Editor's Page)
- ☐ 2. Repartee (Letters)
- ☐ 3. Reviews
- ☐ 4. Notepad (industry news)
- ☐ 5. Help Key (questions)
- ☐ 6. Features
- ☐ 7. Tutorials
- ☐ 8. Hors d'oeuvres (hints/tips)
- ☐ 9. Advertisements
- ☐ 10. Digital Canvas
- ☐ 11. Articles

F. Which of the following categories do you plan to purchase software from in the next 12 months?
- ☐ 1. Entertainment
- ☐ 2. Word Processing
- ☐ 3. Communications
- ☐ 4. Spreadsheets
- ☐ 5. Home Productivity
- ☐ 6. Programming
- ☐ 7. Software Development
- ☐ 8. Video
- ☐ 9. Database Management
- ☐ 10. Financial Management
- ☐ 11. Graphics
- ☐ 12. Education
- ☐ 13. Music
- ☐ 14. Animation
- ☐ 15. Sound/Speech Development
- ☐ 16. CAD/CAM

G. Where did you get this copy of AmigaWorld?
- ☐ 1. I subscribe
- ☐ 2. Newsstand
- ☐ 3. Other

H. Where do you buy your computer products? (Please pick one.)
- ☐ 1. Computer Dealer
- ☐ 2. Mail Order
- ☐ 3. Manufacturer
- ☐ 4. Discount/Department Store
- ☐ 5. Other ____________

I. Do you own an Amiga?
- ☐ 1. Yes
- ☐ 2. No

J. Where do you use your Amiga?
- ☐ 1. Home
- ☐ 2. Work
- ☐ 3. School
- ☐ 4. At home for business
- ☐ 5. Both at home and work
- ☐ 6. Both at home and school
- ☐ 7. I don't use an Amiga

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